Coal Age

Give enough!
FOR ALL RED FEATHER SERVICES

READY TO SERVE . . . p 62

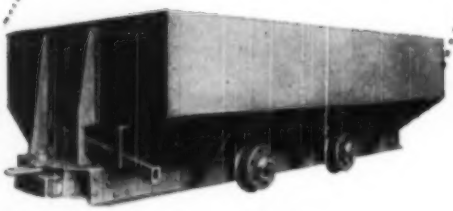
Deep Mining in Highwall • Anthracite Safety
Roof Bolting • Modernizing Power Distribution
Farming Coal Lands • Bore-Hole Drainage
Froth-Flotation Principles • Aerial Mapping

62 Tons per mine car per day...

and a 3½ mile round trip!

When 20 mine cars can haul a million tons of coal in less than 3 years... *you know what constant haulage means!* This amazing record could only have been made with *complete freedom* from serious haulage breakdowns.

But are these 'special' cars? *No*—unless you consider A.C.F. Drop Bottom Mine Cars 'special'... only 48" above the rails... capacity 8 tons. The real difference lies in the *unloading speed.* An entire 10-car trip can dump in 80 seconds—on the move—automatically! Self-lubricated doors open-and-dump, close-and-lock themselves. *Minutes faster,* these A.C.F. Drop Bottom Mine Cars are back at the face for more coal!

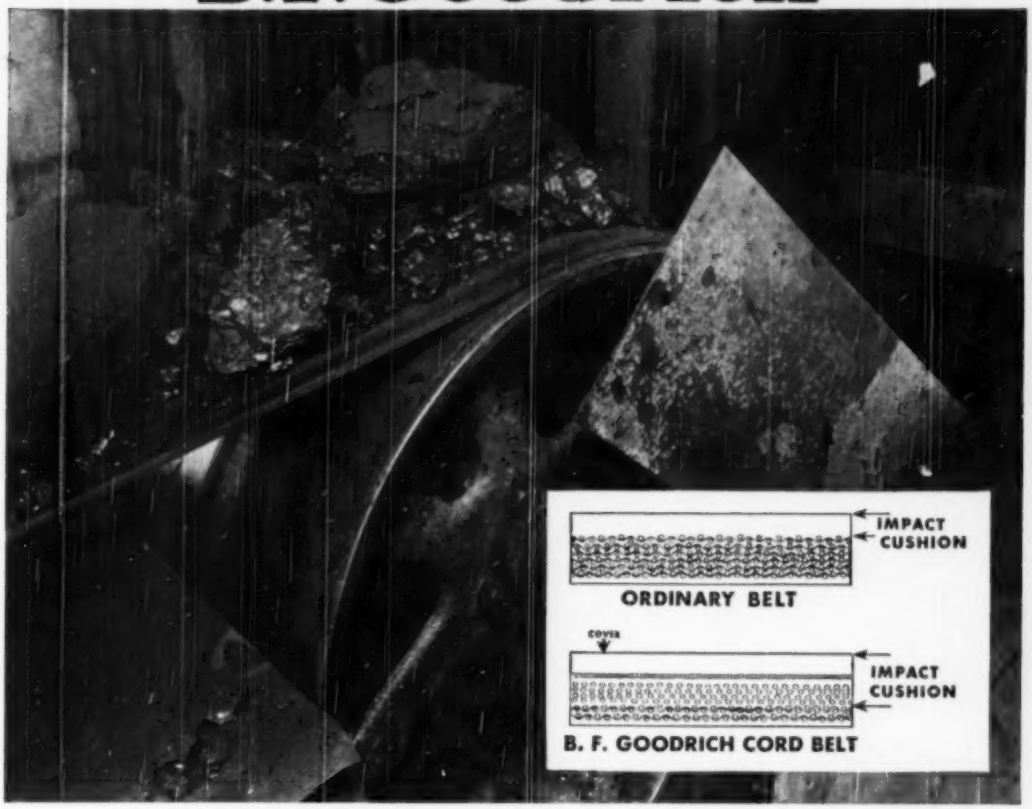


A.C.F. MINE CARS

for Constant Haulage

Let your nearby A.C.F. Sales Representative show you how A.C.F. Drop Bottom Mine Cars may set a new haulage record in your mine. Call him today. American Car and Foundry Company, New York • Chicago • St. Louis • Cleveland • Washington • Philadelphia • San Francisco Pittsburgh • Huntington, W. Va. • Berwick, Pa.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



B.F.Goodrich cord conveyor belt

Gives 2 to 6 times greater impact resistance

EACH lengthwise cord in a B. F. Goodrich cord belt is completely surrounded by rubber — no cross threads tie them together. These cords are parallel, free to flex or "give" lengthwise or crosswise.

Cord belts trough better — Cord belts carry the load with less "spill". Even thick, narrow cord belts trough naturally. And because they trough better, cord belts keep centered on idlers, require less maintenance. Longer centers, higher lifts can be used. Creasing action between idlers is eliminated.

Cord belts for tough jobs — With parallel cords in live rubber, under impact the rubber distorts temporarily; distributes and absorbs shocks that would damage a stiff, unyielding carcass. This impact cushion (see diagram at top of page) resists cuts, gouges. A *Transcord Breaker* floated above and across the cord section helps cushion impact, keeps cover from stretching beyond elastic limits. Provides better adhesion between cover and carcass.

With each cord sealed in rubber, this B. F. Goodrich belt resists effects of acid materials, moisture, mildew.

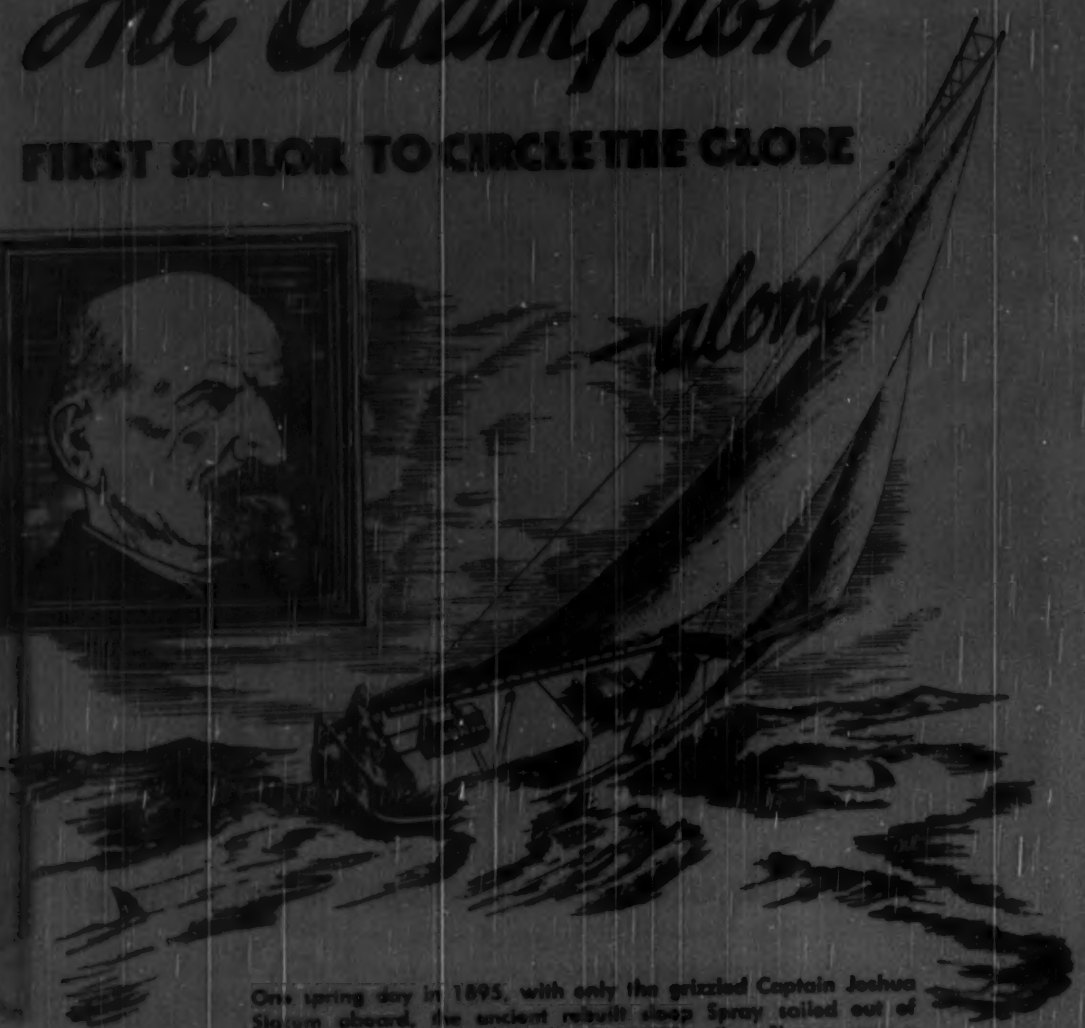
Typical example — The B. F. Goodrich cord belt shown here is ten years old. In service today for the Ingle Coal Corporation, it handles 350 tons an hour of run-of-mine coal weighing 50 lbs. per cubic foot. Troughing is natural; the belt keeps centered on idlers; there has been no maintenance due to impact or wear.

The first B. F. Goodrich cord belt ever made is still on the job after 12 years and over 14 million tons of rough-riding coal. Similar economy in coal handling can be yours by getting in touch with your local BFG distributor or write *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Conveyor Belts BY
B.F.Goodrich
RUBBER FOR INDUSTRY

The Champion

FIRST SAILOR TO CIRCLE THE GLOBE



One spring day in 1895, with only the grizzled Captain Joshua Slocum aboard, the ancient rebuilt sloop Spray sailed out of Boston Harbor, on a voyage of 46,000 miles. Slocum was a veteran sailing-ship Captain without a ship—because he refused to switch to steam. Thirty-eight months later Slocum sailed the Spray back into Newport harbor! He was the first man ever to circumnavigate the globe ALONE, and by sail. He did it the hard way, too, through the Strait of Magellan. Other solitary mariners have since followed Slocum's track, but no one has ever quite matched his daring achievement. Years later Slocum, seeking to repeat his great voyage, put to sea alone again, and was never heard from.

HULBURT OIL & GREASE COMPANY, PHILADELPHIA, PA.

Specialists in Coal Mine Lubrication

The Champion

...IN COAL MINE LUBRICATION

Hulburt Quality GREASE

"The Champion"

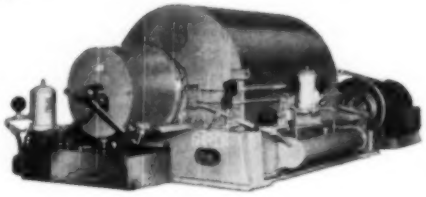
Speaking of getting around—if you'll let a Hulburt Lubrication Engineer go down into your coal mine he'll get around to wherever you have a lubrication problem, roll right into it and solve it. Sometimes he may have to do it the hard way . . . but mostly you'll find the answer to his simply in the proper application of the one lubricant made solely for coal mining machinery . . . HULBURT QUALITY GREASE. Many other "mariners" have followed in Hulburt's wake . . . no one has ever matched its supreme Quality.

COAL is that way, too. The big sizes take care of themselves. But the small (¼" x 0) takes a lot of doing — unless you're smart enough to turn the job over to the BIRD.

The Bird Coal Filter gets the fine coal drier than you can get it by any combination of mechanical methods and equipment you ever tried — 90 to 93% dry with the feed containing 10% minus 200 mesh fines.

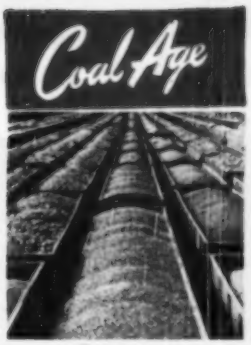
It gets the water so clean you can use it over and over in a closed circuit.

You owe it to your production, your pocketbook and your peace of mind to find out exactly what the Bird Coal Filter will do to meet and lick your fine coal drying problem.



BIRD MACHINE COMPANY
South Walpole, Massachusetts

The BIRD Continuous Centrifugal COAL FILTER



THIS MONTH'S COVER

● ACRES OF COAL on its way to the consumer dramatizes the industry's position in the scheme of things to come. Just why and how coal stands "Ready to Serve" are detailed in the round-up starting on p 62. It's a story that should be told as widely and as often as possible, especially in Washington.

COMING IN COAL AGE

● **How to Get and Use Ideas**—Getting ideas and using them means money to the coal-mining industry and a better living for the man who does a good job of it. A feature designed to help you find, create and use ideas that will benefit you, your company and your industry.

● **The Pleasant View Story**—How West Kentucky Coal Co.'s newest mine brings engineering forethought and practical experience to bear on the problems of efficiency in mining and preparation. Two features will present the facts on mine development, operation and preparation.

● **Moving a Strip Mine** — How Osage was transferred "lock, stock and barrel" from Illinois to Colorado. F. J. Foresman tells how the problems were solved and the results.

● **AC Power Underground**—What the problems are, where the major possibilities lie and what results can be expected. The author is David Stoetzel Jr., of General Electric.

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FEWER BEARING

. . . when you lubricate with TEXACO REGAL STARFAK

You can save many a costly replacement by packing your high-speed grease-lubricated ball and roller bearings with *Texaco Regal Starfak.* It's the premium-quality lubricant that keeps bearings fully protected in even the severest service.

Texaco Regal Starfak outperforms ordinary grease because of its much higher resistance to oxidation, gum formation, separation and leakage – the result of extra processing. Thus, *Texaco Regal Starfak* stays *in* the bearings. And its longer-lasting protection means fewer applications – another saving.

In low-speed, heavy-duty, anti-friction bearings, use *Texaco Marfak.* Your bearings will last longer, your maintenance costs will be less. *More than 350 million pounds of Texaco Marfak have been sold.*

For every machine, there are Texaco lubricants to increase efficiency and reduce your costs. Let a Texaco Lubrication Engineer tell you about them. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN . . .
TEXACO STAR THEATER
starring
MILTON BERLE
on television
every Tuesday night.
See newspaper for
time and station.

TEXACO

TEXACO LUBRICANTS

REPLACEMENTS

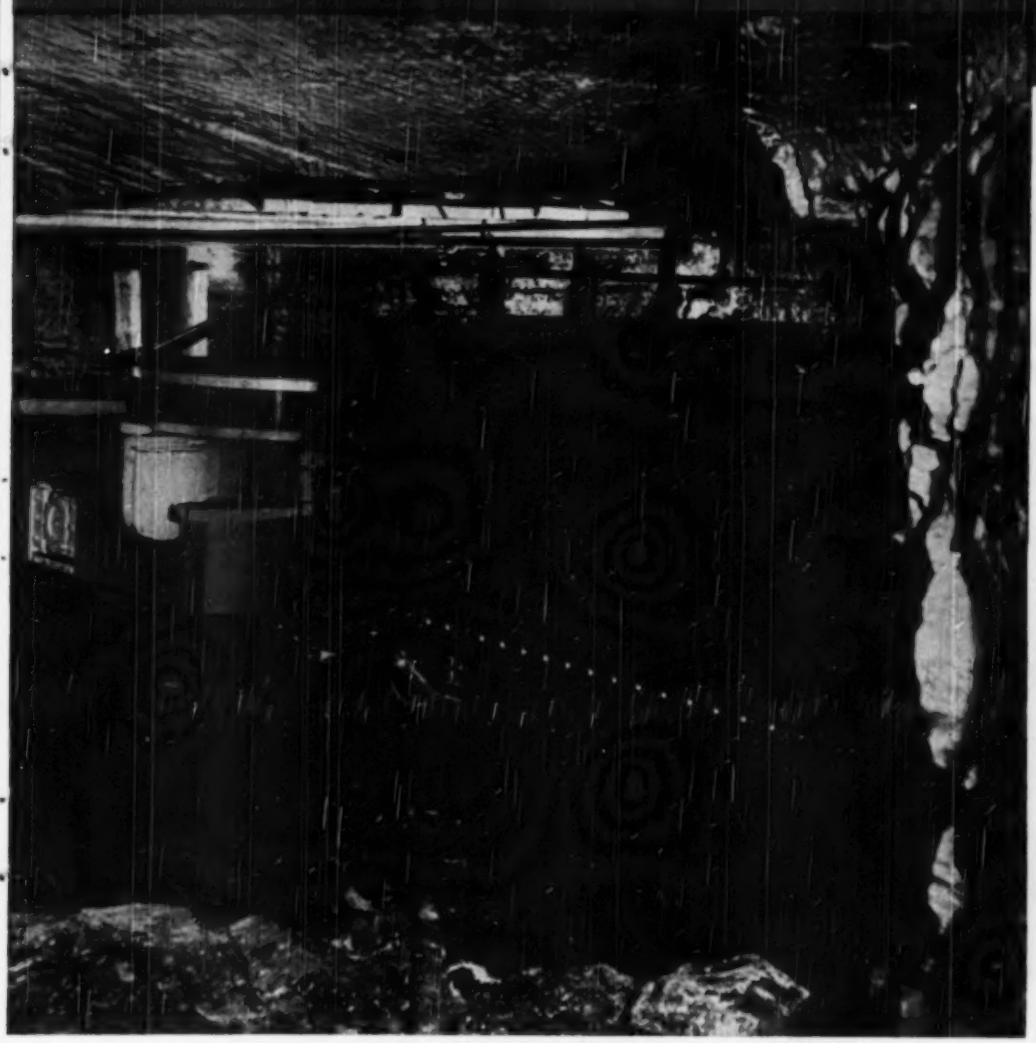


Photo courtesy Westinghouse Electric Corp.

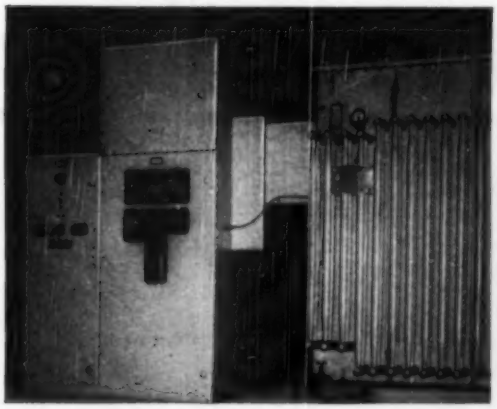
For the Coal Mining Industry

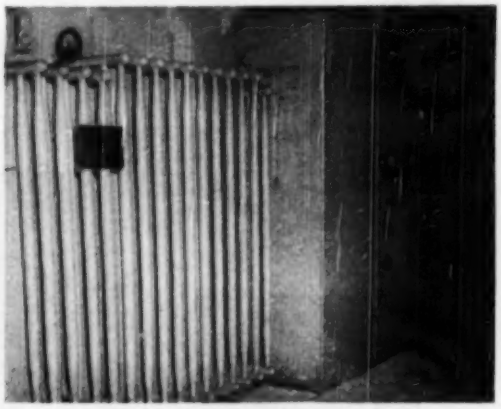
Island Creek saves 3 ways with G-E Rectifier!

Mercury-Arc Rectifiers
—to cut mining costs!

Installation costs cut! In installing this G-E 300-kw mining-type rectifier, Island Creek Coal Co. saved an estimated $140 by eliminating special foundations, cable ducts, etc. needed with rotating converters. Completely automatic in operation, G-E rectifiers can be placed in remote locations, without constant attendance. Use of shorter d-c lines is made possible, and voltage drop is reduced.

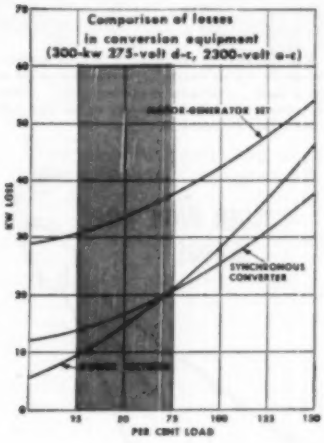
General Electric mining-type rectifier at Island Creek Coal Co., Holden, W. Va., saves an estimated $220 power cost and $250 maintenance cost every year—plus installation savings of $140!





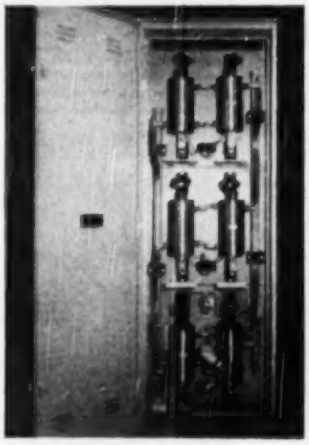
Personnel protected! To minimize the possibility of personnel coming into accidental contact with live parts, all units are deadfront, completely metal enclosed. Shown above are incoming a-c switchgear section and part of power transformer section. (At right: Rest of power transformer section, plus rectifier section and d-c switchgear section.)

Downtime reduced! A G-E rectifier has no major rotating parts to wear and interrupt service for replacement or cleaning. Protective devices automatically trip it off in case of a fault, minimizing downtime caused by damage to equipment. With full voltage at the face, mining machines operate more efficiently, with fewer interruptions.



Power costs cut! (left) Average mining load varies from 25 to 75 per cent of the conversion equipment's rating. In this range, as chart shows, power rectifiers have higher conversion efficiency than rotating machines. Island Creek Coal Co. estimates power savings at $220 annually from one G-E 300-kw rectifier alone.

Maintenance costs cut! (right) Steel panels isolate firing circuits from tubes and water cooling system, protecting electrical components. Rectifier unit has easily accessible parts, needs only an infrequent tube replacement and addition of water in the cooling system. Island Creek Coal Co. calculates its maintenance savings at $250 per year on one G-E rectifier.



SERVICE-PROVED! Over 250 G-E sealed tube mercury-arc rectifiers for mining service, in both stationary and portable types, are now in use throughout the country, some for more than 12 years. For more detailed information, write for new bulletin GEA-4047, or check with your nearest G-E office. *Apparatus Dept., General Electric Company, Schenectady, N. Y.*

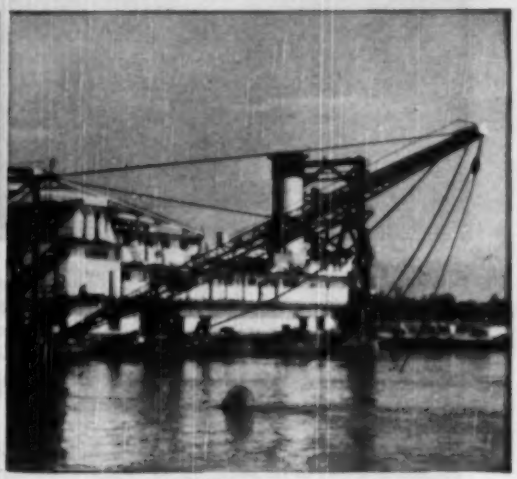
GENERAL ELECTRIC

663-10

FOR JOBS LIKE THESE...

You've got to have a rope with guts

HIGH, WIDE AND HANDSOME. Quarries need wire rope that will run fast, support tremendous weight. This photograph shows TIGER BRAND Wire Rope used for derrick and mast guys, and hoisting ropes, in a nationally-known quarry.

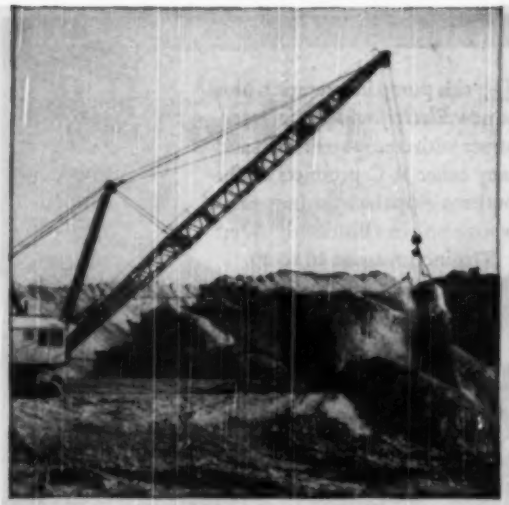


WET AND MUCKY. TIGER BRAND Wire Rope furnishes the muscles for this big Mississippi dredge. Constantly in and out of water . . . subjected to extreme loads . . . TIGER BRAND delivers economical heavy-duty service that pays off in fewer rope replacements.

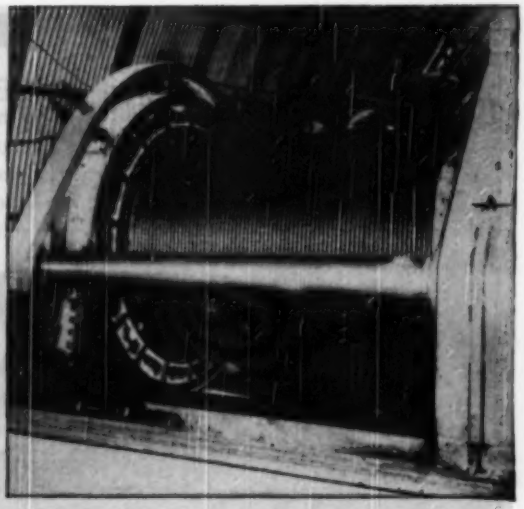
A ROPE'S TOUGHEST DIGGING JOB. Dust and grit spell short life for inferior rope—if it's used in strip mining. But you can count on TIGER BRAND Wire Rope to give matchless performance under the toughest operating conditions.

TIGER WIRE ROPE SLINGS

We can furnish a complete line of 8, 6, 4-part and laid slings as well as all standard and special wire rope fittings. Choose from our standard selection or, if you have a special problem, we'll make special slings to your specifications. Write for our free booklet, "American Tiger Wire Rope Slings."



OUT GOES THE OVERBURDEN. Stripping overburden usually means high shock stresses on the rope. TIGER BRAND Wire Rope—made in the widest variety of styles—is available to meet unusual conditions of shock . . . abrasion . . . high loads.



READY FOR A WORKOUT. TIGER BRAND Wire Rope has the flexibility to withstand constant coiling and uncoiling. When properly lubricated and maintained, TIGER BRAND Wire Rope will give you dollar for dollar service that can't be beat by any other wire rope.

FOR HIGH STRENGTH, GREAT FLEXIBILITY AND A COMPLETE RANGE OF SIZES AND STYLES—USE

TIGER BRAND WIRE ROPE

Judge it by the jobs it handles!

Most premature rope failures can be traced to improper selection, maintenance or installation.

Your TIGER BRAND field service engineer can help you with all these problems. A skilled engineer, he has access to a tremendous file of case histories. He knows how to pick the *best* kind of wire rope for your own job—the type of core, the kind of steel, the construction, the lay and the finish—all things that must be considered for top performance.

Your TIGER BRAND field service engineer will do more than help you select the rope. He'll show you how to use it most effectively with your running equipment. He might, for example, suggest that you use:

MANGANESE STEEL SHEAVES TO INCREASE ROPE LIFE

Soft steel sheaves can cause trouble. Tiny slivers of metal become imbedded in the rope and "grind" it until it fails. Furthermore, the rope will cause corrugations in the sheave. In turn, these corrugations can ruin the rope that caused them. Manganese steel sheaves actually harden and polish themselves under severe pressure and friction. So they continuously present a smooth surface to the rope—and lengthen its life.

If you have a special application that's tough on wire rope, get in touch with your TIGER BRAND field service engineer. Meanwhile, you'll find a wealth of knowledge in our information-packed handbook, "American TIGER BRAND Wire Rope." Write for it today.

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TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
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USS

AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

SEE this pump in operation plus the new *Electrifugal* pump, transformer with transparent shell and many other A-C products at the Southern Appalachian Industrial Exposition in Bluefield, West Virginia, August 16 to 19.

This Pump Keeps Your Coal Washing Costs Low

THE ALLIS-CHALMERS CW PUMP is especially designed to stand up under the rough service of pumping slurries in coal washing operations. Hundreds of installations in coal preparation plants like the one above have proved the CW's ability to deliver really low cost performance.

Low Operating Cost

All wearing parts of the CW are made of *Allisite*, a high nickel iron alloyed for maximum abrasion resistance. All parts are of extra heavy construction. And every application is engineered by a specialist who knows coal washing problems and how to solve them. The result is long life under the severest operating conditions.

Low Maintenance Cost

Eventually every coal washing pump needs service. Service on the CW is quick and easy. Parts are simple and easy to handle. The CW can be torn down, a part replaced and back in action again in *less than a half hour*. Piping need not be disturbed unless casing is replaced.

Head and capacity can be changed instantly when the CW is equipped with *Texrope* V-belt drive and *Vari-Pitch* Automatic sheave. Standardized parts interchangeable between various sizes of pumps reduce spare parts inventory.

Texrope, Vari-Pitch, Electrifugal and Allisite are Allis-Chalmers trademarks.

Get the Complete Story

Your nearest A-C representative will be glad to give you complete facts and figures on CW performance. Call him or write for Bulletin 08B6381. A-3127

ALLIS-CHALMERS, 968A SO. 70 ST.
MILWAUKEE, WIS.

ONLY FIVE WEARING PARTS

Shaft sleeve, impeller, casing, two wear plates. All easy to handle and easy to replace.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

World's record "underground railroad"

Goodyear COMPASS Belt Is Longest Single-Flight Conveyor Ever Installed In Mine Entry

LONGEST single-flight belt installed in an underground entry is the Goodyear COMPASS 40 conveyor recommended by the G.T.M.—Goodyear Technical Man—for a West Virginia company. Spliced endless, and operating around pulleys 4000 ft. on centers (soon to be extended to 6000 ft.), it carries a maximum of 300 tons per hour at 350 f.p.m. The blueprint below shows you how Goodyear's exclusive COMPASS construction makes this huge belt possible.

Ask the G.T.M. to demonstrate the lower haulage costs you can get with COMPASS belts—over any distance from a mile or more underground to over a hundred miles cross country. You can reach him through your nearest Goodyear Industrial Rubber Products Distributor, or by writing Goodyear, Akron 16, Ohio.

FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

GOODYEAR INDUSTRIAL RUBBER PRODUCTS
-Specified COMPASS 40 CORD CONVEYOR BELT
for LONG-DISTANCE HIGH-TENSION OPERATION
A
B
C
A—Tough, long-wearing cover protects carcass
B—Single plane of rope cords give high-tensile strength, practically zero stretch. Extra flexibility permits more compact installation with smaller pulleys
C—Fabric envelope protects cords
Mildew-inhibited throughout

Compass—T.M. The Goodyear Tire & Rubber Company

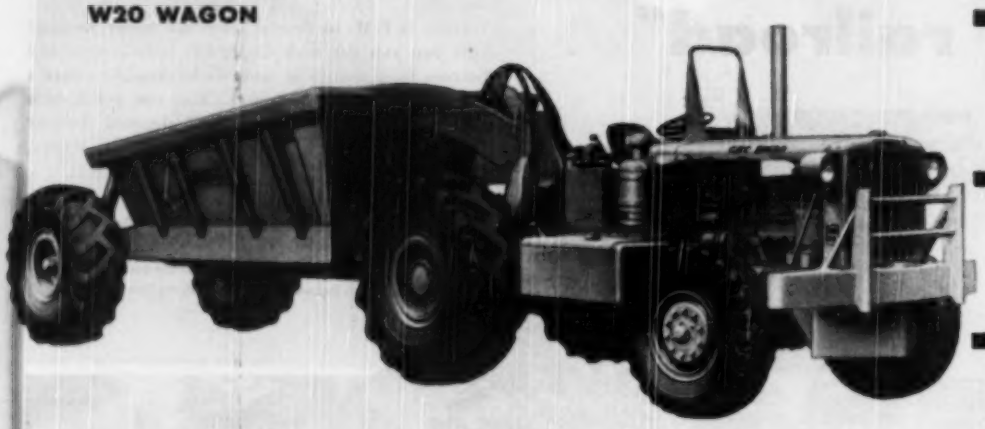
We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

GOODYEAR

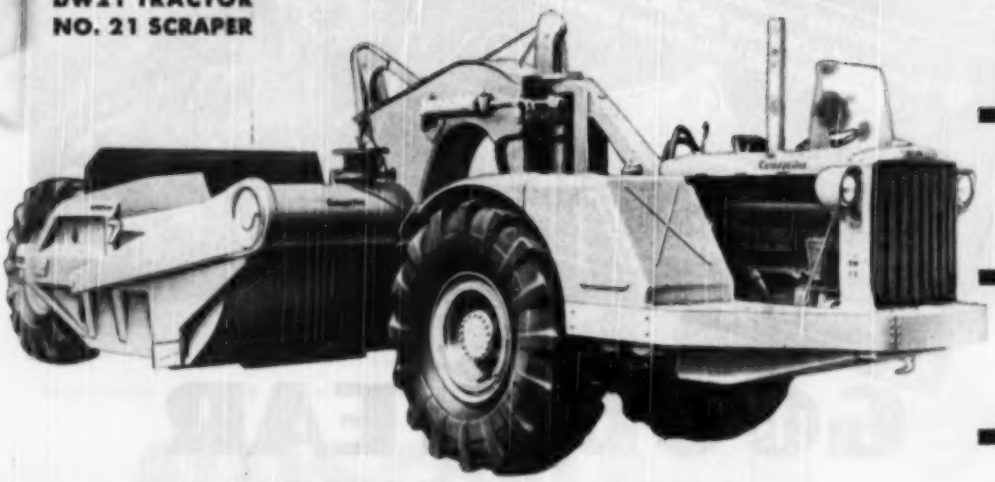
THE GREATEST NAME IN RUBBER

2 GREAT NEW ADDITIONS

DW20 TRACTOR
W20 WAGON



DW21 TRACTOR
NO. 21 SCRAPER



TO THE "CATERPILLAR" LINE

—TO BRING YOU STILL GREATER EARTHMOVING CAPACITY AND SPEED

Accompanying the Tractor features generalized (below, right) the Wagon member of this big-capacity unit offers:

17 cu. yds. capacity, struck; 25 cu. yds., heaped.

Travel speeds, through tractor's 5 gear ratios, ranging from 2.88 to 26.6 m.p.h.

Generous size hopper to provide good target for shovel or dragline loading.

Controlled dumping . . . openings can be varied without mechanical adjustment—permitting either dumping or windrowing.

Accurate hydraulically controlled dumping with positive mechanical lock on dump doors.

THE DW20 TRACTOR AND NO. 20 SCRAPER UNIT

The "Cat" No. 20 Scraper is available also for the DW20 Tractor. It has the same capacity and general specifications (except in type of gooseneck) as the No. 21 Scraper described below.

THE ENGINE: ***Both prime movers have the new 6-cylinder "Cat" Diesel Engine . . . 275 HP. peak capacity at 2,000 r.p.m. tested in accordance with A.S.M.E. Power Test Codes; 225 HP. at 1,900 r.p.m. available at the flywheel.***

Accompanying the Tractor features generalized (right), the 2-wheel DW21 offers:

Full 90° turn each way.

Travel speeds, through 5 gear ratios, ranging from 2.16 to 20 m.p.h.

Scraper capacity is 15 cu. yds., struck; 19½ cu. yds., heaped. (With available 12" extensions, 18 cu. yds., struck; 22½ cu. yds., heaped.)

Bowl and apron are designed to promote "boiling" action of earth through center of load—for full-measure yardage and minimum loading time.

Large low-pressure tires for easy load flotation.

'Dozer-type ejection for positive "kicking out" of sticky material; dependable spring-action ejector return.

Open bowl design to permit visible loading under shovel or dragline.

Adjustable rear axle to permit level cuts and desired settings.

Double bottom of special alloy steel. Self-sharpening reversible cutting edge.

High apron lift, low center of gravity.

FOR high-speed hauling . . . for high production . . . "Caterpillar" offers two new earthmoving units—the 4-wheel DW20 and the 2-wheel DW21.

With a completely new 6-cylinder Diesel Engine producing 225 HP. available at the flywheel, the newcomers give users their choice of high-speed wheel-type prime movers.

The DW20, with top speed of 26.6 m.p.h., has 2 design matched trailed units . . . the "Cat" W20 Wagon (25 cu. yds. heaped capacity) and the "Cat" No. 20 Scraper (19½ cu. yds. heaped capacity).

The DW21, with top speed of 20 m.p.h., trails the "Cat" No. 21 Scraper (19½ cu. yds. heaped capacity).

And, as always, "Caterpillar" quality, dependability, durability and work capacity are built in . . . backed by the unparalleled parts and service facilities of the world-wide "Caterpillar" dealer organization.

For further information on these two new units, contact your dealer or write the factory.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

TRANSMISSION

Constant-mesh transmission, and heavy-duty clutch. Special locking device that prevents gears from becoming disengaged.

BRAKES

Each large, heavy-duty brake is 22" in diameter, 7" wide. Compressed air energized brakes on both tractor and drawn member of unit. Handy control valves for applying both sets of brakes, and to right or left driving wheel.

STEERING

Hydraulic booster steering that follows the natural "feel of the road" hand guidance. Heavy steel stops for keeping gooseneck of drawn equipment from jackknifing.

OPERATOR COMFORT

Airfoam rubber cushion on bucket-type seat mounted on coil spring with hydraulic snubber. All controls within easy reach. Excellent visibility.

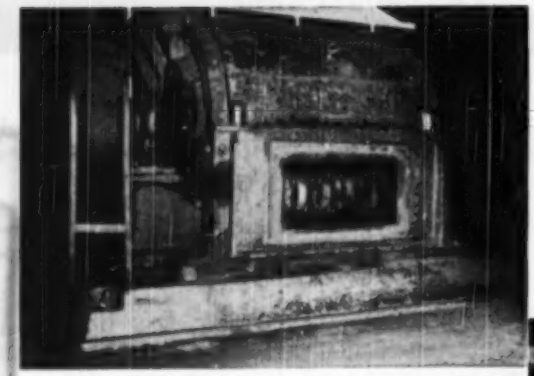
CATERPILLAR

DIESEL ENGINES • TRACTORS
MOTOR GRADERS • EARTHMOVING EQUIPMENT

PROVED *Champions of Quality...*

AMERICAN CRUSHERS handle high tonnage for years with amazingly LOW parts replacement costs!

THE MOST CONVINCING PROOF of American Crusher *quality* can be obtained by comparing *cost of replacement parts needed* to *tons of coal crushed* in specific operations. Taken from an extensive independent survey of users, the following case analyses are typical—

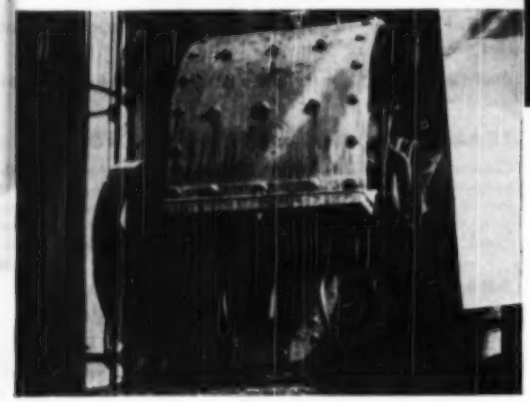


A Central Station in New Jersey

TYPE CRUSHER: AMERICAN 42S
YEARS IN SERVICE: TWENTY
TONNAGE HANDLED: 6,000,000
PARTS COST PER TON: $.00025

A Power Plant in Illinois

TYPE CRUSHER: AMERICAN 42S
YEARS IN SERVICE: SIX
TONNAGES HANDLED: 2,950,000
PARTS COST PER TON: $.0004



An Industrial Power Plant in Ohio

TYPE CRUSHER: AMERICAN 15C-1
YEARS IN SERVICE: NINETEEN
TONNAGE HANDLED: 182,000
PARTS COST PER TON: $.0000

These typically low parts cost figures are revealing—*they help to explain why American Crushers can reduce coal for less than 1 cent per ton even when all other operating costs are included!*

Write for LITERATURE ON AMERICAN CRUSHERS

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Ave.
St. Louis 10, Mo.

Helps "walking" dragline put best foot forward . . .

When this 1280-ton dragline was first put into operation at a large midwest surface mine, its operators gave special attention to the lubrication of the walking cams. They particularly wanted to use a lubricant that did not have to be heated for application. When one such a product was tried, however, it failed to cushion cam action. Vibration was excessive.

A Standard Oil lubrication specialist recommended the use of Standard Oil's HEAVY-DUTY CAM AND GEAR LUBRICANT. A trial convinced operators that it was the product they wanted. Because the HEAVY-DUTY CAM AND GEAR LUBRICANT can be applied in solid form, application was easily handled by one man during moving operations. The lubricant did not tend to cake or harden but formed a strong lubricating cushion that minimized vibration of the walking cams. Only small amounts of the product were required to provide good lubrication.

To-day, after 1½ years' operation of the dragline, mine operators report that the use of HEAVY-DUTY CAM AND GEAR LUBRICANT has meant important savings through low lubricant consumption, minimum time and labor for its application, and trouble-free lubrication of the walking cams.

HEAVY-DUTY CAM AND GEAR TRADE MARK **Lubricant**

Savings such as these have been brought to a host of midwest mines by Standard Oil's lubrication engineering service and high quality products. How these service and product advantages can help you is explained at the right.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

What's YOUR problem?

Fred A. Barnes, lubrication specialist at Standard Oil's Decatur office, helped this midwest mine (see left) make important savings with Standard Oil's HEAVY-DUTY CAM AND GEAR LUBRICANT. He was close at hand, gave operators on-the-spot engineering service that was vital to the solution of their lubrication problem.

There's a corps of Standard Oil lubrication specialists throughout the Midwest. You'll find one located near your mine. You can contact him easily and quickly through your local Standard Oil (Indiana) office. Use this man's special training and practical experience to help you make real savings. He offers a complete line of mine lubricants including special-purpose HEAVY-DUTY CAM AND GEAR LUBRICANT and such widely used products as:

STANOIL Industrial Oils—Simplify your lubrication jobs by using this *one* line of oils that provides cleaner operation of loader and crane hydraulic units, supplies effective lubrication in compressors, gear cases, and circulating systems.

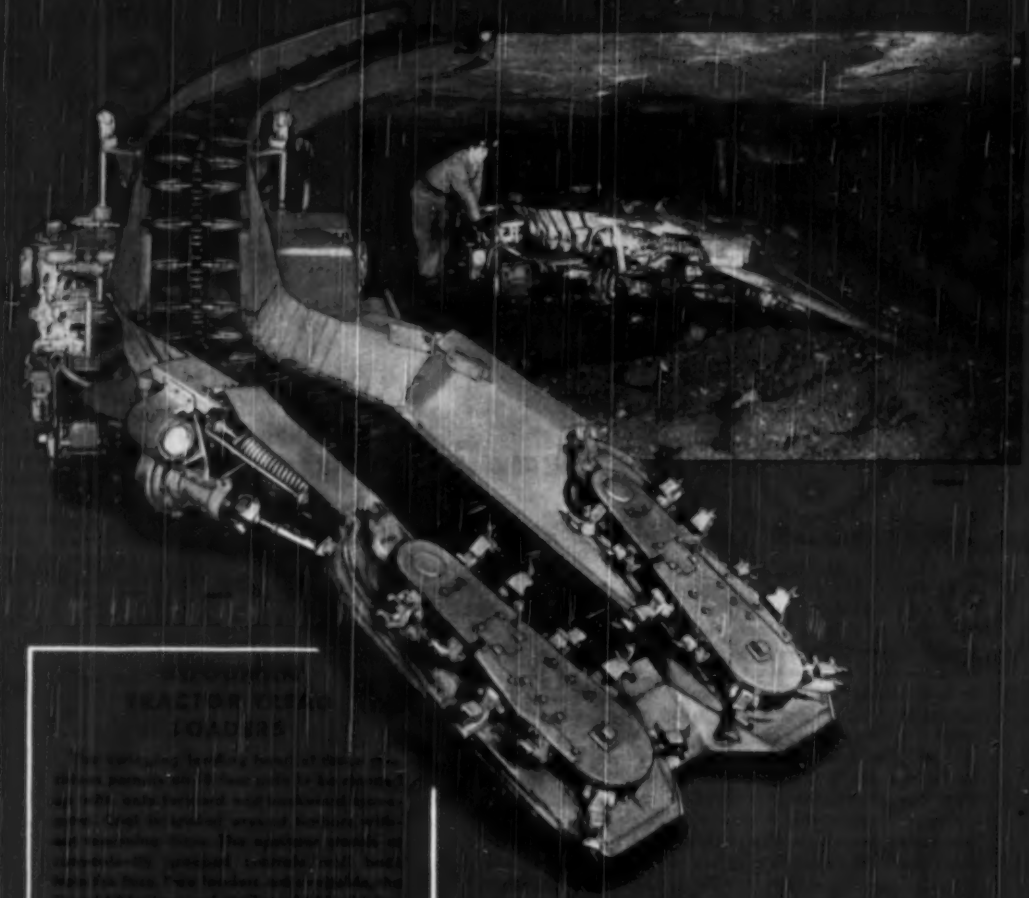
SUPERLA Mine Lubricants—These new, improved oils and greases provide better lubrication of cutters, loaders, locomotives, mine cars, and other underground equipment. They eliminate transmission-case deposits, reduce clutch-plate gumming, and minimize wear on gears and bearings.

CALUMET Viscous Lubricants—On open gears and wire rope, these greases resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire rope.

STANDARD OIL COMPANY (INDIANA) STANDARD

492 TONS PER SHIFT with

GOODMAN TRACTOR TREAD LOADERS



GOODMAN MANUFACTURING COMPANY

HALSTED STREET

and SHUTTLE CARS

AT 48TH • CHICAGO 9, ILLINOIS

OLIVER DIESEL POWER

What better proof could you ask of the *economy* you get with the new Oliver "88" Diesel Wheel Tractor? On this job an "88" Diesel is handling *two* rubber-tired compaction rollers vs. a gasoline powered tractor of equivalent size pulling *one* roller. The owner reports a fuel cost saving of 50% even though the Diesel model was pulling a load of 39,000 lbs. vs. the Gasoline model pulling a load of 25,000 lbs.

The new Oliver "88" is a natural for industrial wheel tractor operations. It's remarkably easy to start . . . requires no starting preparations. Overall efficiency is high due to superior air and fuel mixture. Efficient burning of fuel and air assures exceptional fuel savings. Prolonged piston head pressure increases lugging ability under heavy loads.

You'll find it will pay dividends in increased load handling ability . . . lower operating costs to investigate the new Oliver "88" Diesel Industrial Wheel Tractor. Your Oliver Industrial Distributor will give you the complete story.

THE OLIVER CORPORATION

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

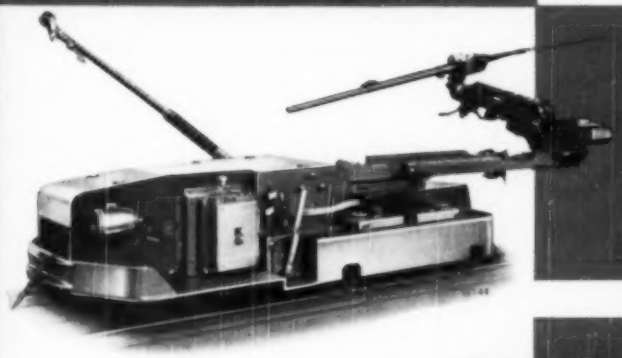
A complete line of Industrial Wheel and Crawler Tractors

JEFFREY DRILLING MACHINES

FOR

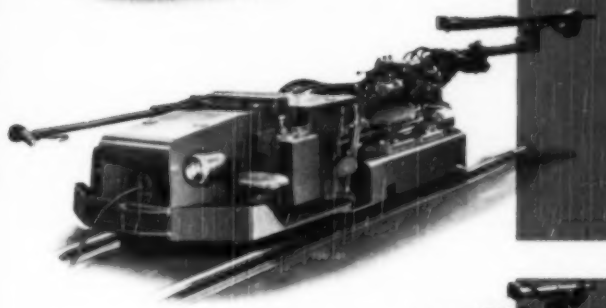
High Speed Drilling in Track or off-Track Mining

A TYPE AND SIZE TO MEET ANY REQUIREMENT

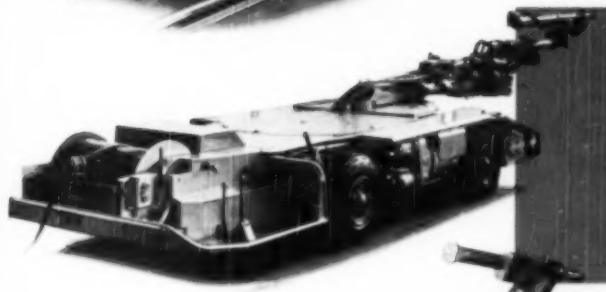


FOR TRACK OPERATION

36-A Track Type Drilling Machine, electrically operated. Can be furnished with either one or two drill arms. Has self-propelling track drives by 11 H. P. motor with a tramming speed of 3½ to 6 m. p. h. Drill is equipped with 5 H. P. motor. Auger can be withdrawn by power without reversing direction of rotation—hole is cleaned of all cuttings.

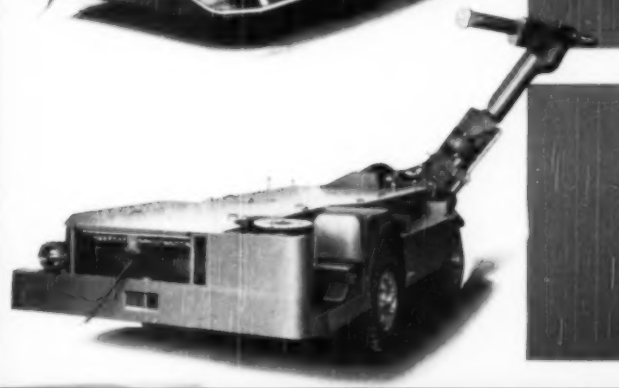


36-PH is an electrically and hydraulically operated track type machine—equipped with one drill arm only. Same general design as the 36-A (above) except that hydraulic power is provided for driving and feeding the auger, swinging the drill and arm, and for elevating the drill boom.

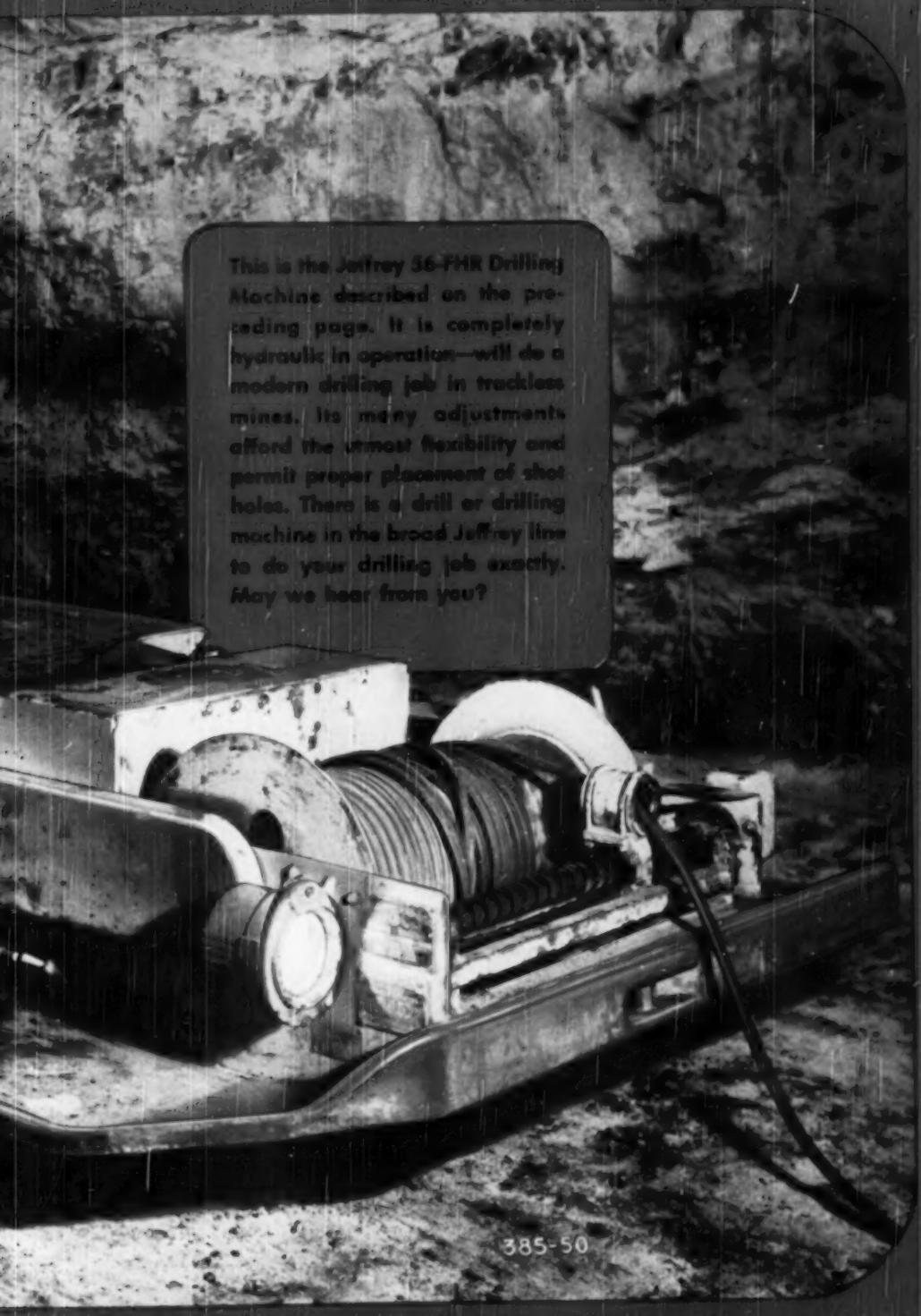


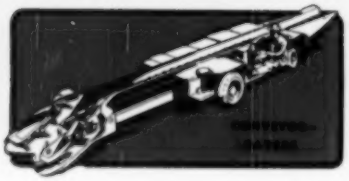
RUBBER TIRE MOUNTED MACHINES

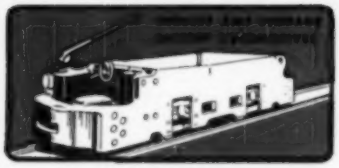
36-PHR is similar to the 36-PH in basic construction and operation. Tramming is accomplished by two hydraulic motors. Cable reel also hydraulically operated. Only one drill arm provided.

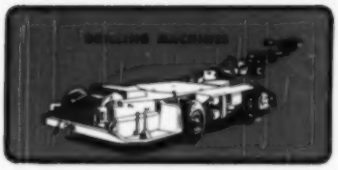


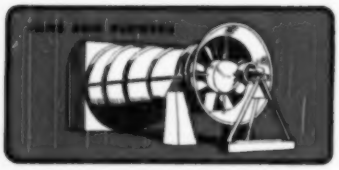
74-RH is also rubber tire mounted and is a heavy duty drilling machine—either one or two arms. Electric motor drives hydraulic pumps which provide power for tramming and driving the cable reel as well as all operations of drill.

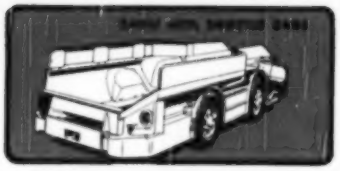

This is the Jeffrey 36-FHR Drilling Machine described on the preceding page. It is completely hydraulic in operation—will do a modern drilling job in trackless mines. Its many adjustments afford the utmost flexibility and permit proper placement of shot holes. There is a drill or drilling machine in the broad Jeffrey line to do your drilling job exactly. May we hear from you?
385-50

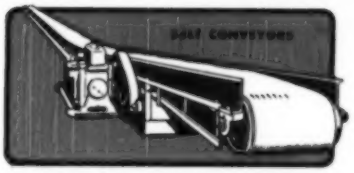


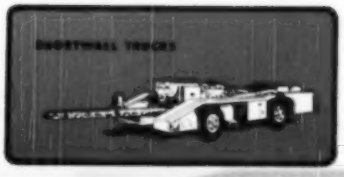












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EQUIPMENT FOR COAL MINES

THE JEFFREY MANUFACTURING COMPANY

Established 1877

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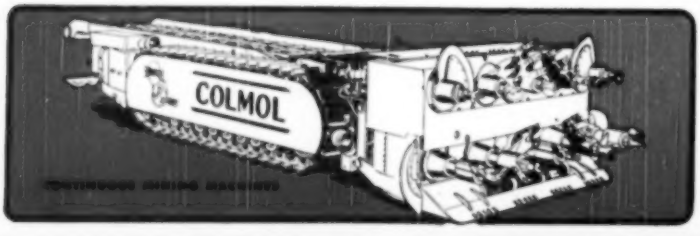

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Many wire rope users who keep an eye on their operating costs have proved by the accurate yardstick of performance that "HERCULES" (Red-Strand) Wire Rope provides longer wear . . . faster and more *continuous* work . . . increased profit.

Such results are never a matter of chance; definite policies involving materials, manufacturing methods, equipment and experience, insure them.

Made in Round Strand and Flattened Strand constructions, Preformed or Non-Preformed; there is a correct type for every purpose.

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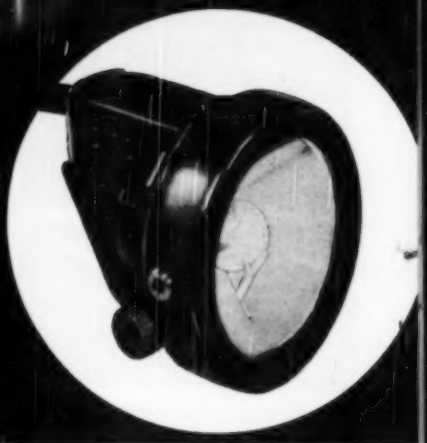
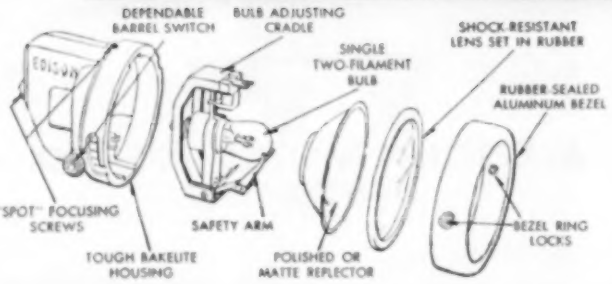


NOTICE THE EDISON HEADPIECE REFINEMENTS

Every feature of the Edison headpiece reflects superior design engineering for better service. Headpiece is easily adapted for strong "spot" or flood beam. Simple 2-screw adjustment of spot without disassembly enables perfect focus always. The single gas-filled bulb has two filaments of equal rating, so that effective working light is always available by a turn of the barrel-switch that operates both filaments. Quick removal and re-assembly of the reflector, bulb or rubber-cushioned lens is easy as the positive bezel-locking ring requires only a ⅛ turn—no threads. Write for descriptive bulletin.



Effective Light

BETTER DIRECTED TO THE JOB!

Edison MODEL *R-4* ELECTRIC CAP LAMP

U. S. Bureau of Mines Approval No. 29

The Edison Model R-4 Electric Cap Lamp *does* more because it *has* more! This most essential tool of the miner increases tonnage with more light and better light . . . more convenience in use, complete dependability, and lower maintenance.

Let us arrange a demonstration—and give you the facts, too, on lower handling costs!

PIERCING, LONG-RANGE SPOT OR FLOODLIGHT BEAM

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BALANCED HEADPIECE

SINGLE BULB WITH TWIN FILAMENTS

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BRADDOCK, THOMAS AND MEADE STREETS . . . . . PITTSBURGH 8, PA.

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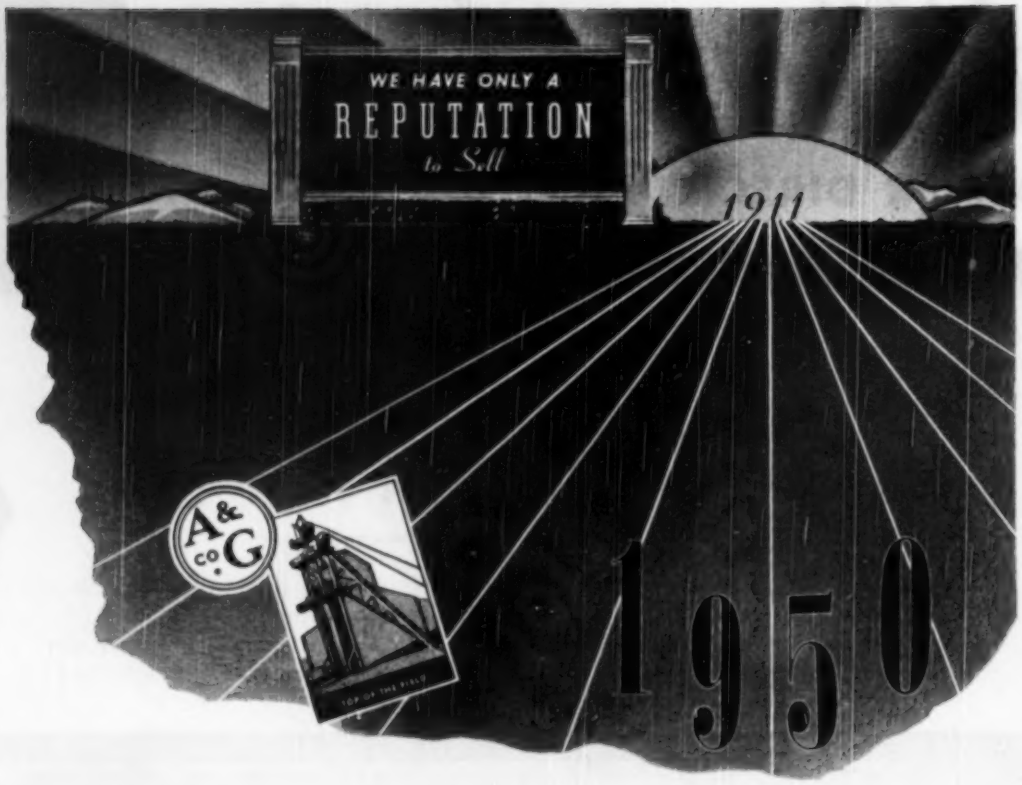

Through a period of 39 years, this organization has operated strictly as design and construction engineers, with almost all projects limited to the mining field.

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As evidenced by repeat assignments, A&G engineers have always advanced the most modern in physical structures and in methods. The needs of the times were fully met and ample provision made so that all immediate economies realized carried on through the years.

A&G, being exclusively an engineering organization, has no machinery to sell. Our equipment recommendations are made to suit the particular production problems, and purchases made from various sources accordingly.

Thus, through a long and successful career, we have earned a reputation which we greatly value and will protect. It is the only thing we have to sell.

Operating on a cost and fee basis has proved advantageous in a financial way to all operators whom we have served. Cost being a variable may go up or down in accordance with market prices.

This however has never been a serious consideration over original figuring. Our fee plan can give you one of two arrangements—one as fixed at time of contract—one on a small percentage basis, going up or down as based on final costs.

In every case, this organization can save you money in new structures as well as in revamping old ones—the modern results we achieve will cut your production costs materially.

When you are ready let us know and we will contact you.

ALLEN & GARCIA COMPANY

CONSULTING AND CONSTRUCTING ENGINEERS

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MOISTURE RESISTANCE

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RESISTANCE TO HEAT and AGING

...All Three In One High-Voltage Cable!

Study the facts behind high-voltage cable failures and you'll readily realize just how much moisture resistance, ozone resistance, and resistance to heat and aging mean to high-voltage transmission and distribution systems. Now — for the first time — all three properties are combined in a single insulation, Anhydrex XX — available only in Simplex-ANHYDREX XX Cables.

Aged in an air oven at the grueling temperature of 250 F. (121 C.), Anhydrex XX has proved itself to be far and away your most dependable assurance of low-cost, trouble-free cable operation at the higher voltages. Here's how:

Aged for 16 weeks, it retained approximately 50% of its tensile strength, nearly 68% of its elongation. More than that, its rate of deterioration after the first few weeks was very slight, indicating exceptional stability and long life. It remained rubber-like in quality and appearance and was still suitable for further use. Compare this with ordinary vegetable oil base and heat-resistant compounds which, inside of only 3 weeks, became brittle and cracked and crumbled.

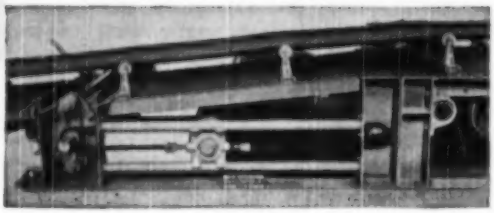
Aged for 7 days, Anhydrex XX was immersed for a week in distilled water at 158 F. (70 C.) and absorbed less than 15 mg. per square inch of exposed surface.

Aged for 7 days, it was bent around a mandrel and exposed to .03% ozone for 4 hours yet would not crack.

Compare these values with those of any other high-voltage insulation. You'll find a big difference; a difference that pays off in more economical, more efficient, and more reliable power transmission whenever Simplex-ANHYDREX XX Cables are on the job. If you would like more complete information and specification data on Anhydrex XX, simply drop us a line at the below address.

SIMPLEX WIRE AND CABLE COMPANY
79 Sidney Street, Cambridge 39, Massachusetts

WHATEVER YOU NEED GET IT "OFF-THE-SHELF"

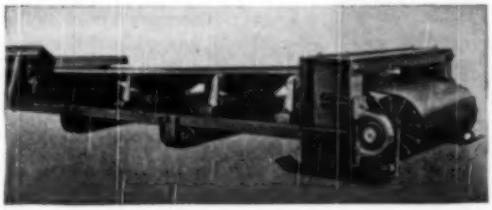


TAIL SECTION

Telescopic type to provide tail takeup action. Easy to clean out—no steel work under tail pulley. Has transverse cover to protect pulley, bearings *and belt*. Strong enough so you can rest a feeder on it.

INTERNAL TAKEUP

Located directly back of the drive. Handles 10′ of belt slack. Operated by reversible ratchet-wrench working on gear reduction to minimize manual effort. Double-acting pawl prevents backing-up. Worked from either side of conveyor.



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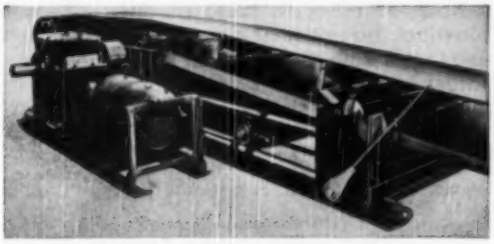
Shipped Complete—Right Out of Stock— from Passaic, N. J., and Charleston, W. Va.

Every mine is different—every mine has different underground conveying problems. That's why Hewitt-Robins makes not one but *three* different types of mine conveyors. That means mine operators can match Hewitt-Robins equipment against their own *specific requirements* and get exactly what they need, right out of Hewitt-Robins warehouses in Passaic and Charleston. Not just the conveyor machinery itself, but belt, motors, reducers and drives!

Hewitt-Robins *Types I* and *IS Mine Conveyors* have *internal* drive for level, *up*hill or *down*hill operation; in 26", 30", 36" widths, lengths up to 3000 feet or more if needed. *Type H* has head drive for level or *up*hill operation; in 26" and 30" widths, lengths up to 2000 feet.

Intermediate Sections are standard, fit all types, simple to assemble because both ends are identical and need no "matching up." Available in 8′ and 10′ lengths. Also available are standard 12′ Intermediate Sections—channel construction, bolted connections—for permanent 30", 36" and 42" wide main haulage installations, using the standard terminals.

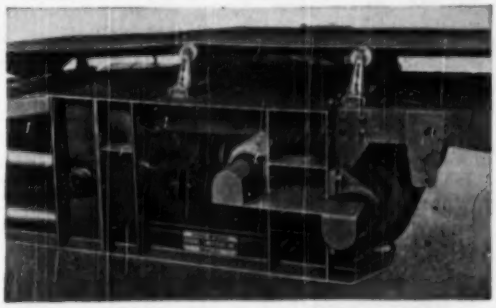


UNIFIED DRIVE SECTION

Motor, reducer and controls mounted on a single base—skid-designed for easy moving about. Can be located on either side of the conveyor. Drive reversible—incoming for men and material, outgoing for high output of product.

You can choose single or tandem pulley drive, internal or tail takeup, the length and belt width that fits your particular mine . . . but in every case you get famed Ajax® heavy-duty belting, Hewitt-Robins ball-bearing, one-shot lubrication idlers, lagged pulleys for maximum power transmission . . . over half a century of engineering and manufacturing know-how!

Remember—*only Hewitt-Robins* makes both machinery and belt; *only Hewitt-Robins* is willing and able to take unified responsibility for successful installation and operation! For complete specifications—or out-of-stock delivery—write Hewitt-Robins Incorporated, 1010 Pennsylvania Ave., Charleston, W. Va., or 270 Passaic Ave., Passaic, N. J.



SINGLE OR TANDEM DRIVE

Hewitt-Robins Mine Conveyors come equipped with *both* single and tandem pulley drive elements. Provide ample horsepower for lift and length up to the very limits of belt capacity. Reeving of belt handles level, uphill or downhill service requirements.

HEWITT-ROBINS
MINE CONVEYORS

HEWITT-ROBINS HR INCORPORATED

BELT CONVEYORS (*belting and machinery*) • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS • FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS • RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS • TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

THE *Femco* 1 TO 10-SHOT FIRER

An AUTHENTIC ORIGINAL

Whether you're an art expert or coal expert, you'll recognize this truth: There's only **one authentic original,** topping all imitations as **the** foremost painting . . . or **the** foremost shot firer.

Such an original work of engineering is Femco's 1 to 10-Shot Firer . . . the first capacitor-operated shot firer developed specifically for coal miners everywhere.

Some years ago Femco pioneered the special circuit which enabled it to produce the first shot firer not dependent on speed of operation for effectiveness.

Now, whether in mine or open pit blasting, the critics, the men who mine, use the Femco, the lightest, surest and safest 1 to 10-shot firer in the long history of coal.

So for CONVENIENCE ➧ Weighs slightly over 1 lb. Can be carried and fired from belt. Insertion of Safety Key charges capacitors from battery; neon light gives "ready" signal, and charge is fired by removing Safety Key.

SAFETY ➧ Permissible 10-shot blasting unit U. S. Bureau of Mines Approval 1603. Cannot be fired accidentally since battery disconnects from capacitors which transfer charge to firing line. Battery cannot be sparked or otherwise short circuited.

and (B)lasting DEPENDABILITY ➧ When neon light glows you are ready to fire! Fires ten shots as easily as one.

Use Femco's Authentic Original—the 1 to 10-Shot Firer!

FARMERS ENGINEERING AND MANUFACTURING CO.

549 BRUSHTON AVE. • PITTSBURGH 21, PA. • CHurchill 1-5050

Specialists in Electronic Communications

. . IN BUS POWER
This is the Diesel
that gave power users new ideas
. . IN CONSTRUCTION EQUIPMENT
. . IN MARINE POWER
. . IN PORTABLE POWER

SHOW an engineer a better source of power and things start happening fast.

That's illustrated by events since General Motors first introduced the "71" Series of two-, three-, four- and six-cylinder Diesel engines, ranging from 50 to 200 horsepower—little brothers of the famed two-cycle GM Diesels that drive so many crack American passenger and freight trains.

Bus engineers went for the "71" at first sight. They liked its compactness, its fuel economy, its clean-burning operation. Now more than 20,000 city and inter-city buses are powered by GM "71" Diesel engines.

Army and Navy engineers approved its rugged strength and dependability. During the war they used 182,000 GM "71" Diesels to operate landing craft, tanks, tractors, bulldozers and other military vehicles.

So, too, have designers of all types of power-driven equipment turned to the GM "71" for low-cost efficient power. Today they are using it in heavy-duty trucks, tractors and earth movers, in work and pleasure boats, in cotton gins, lumber mills, oil rigs and for many other mobile, portable and stationary uses—*with remarkably successful results!*

That is because the GM "71" is a two-cycle engine that delivers power on every piston downstroke—in contrast to most Diesels that deliver power only on every second downstroke. This makes GM Series 71 Diesels more compact, lighter, faster-accelerating, smoother, cleaner-burning—*and twelve years' experience in applications totaling over 46,000,000 horsepower proves it!*

The GM "71" gives you Diesel brawn without the bulk. *It is Diesel power at its best.*

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . . . Up TO 275 H. P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS . . . Up TO 800 H. P.

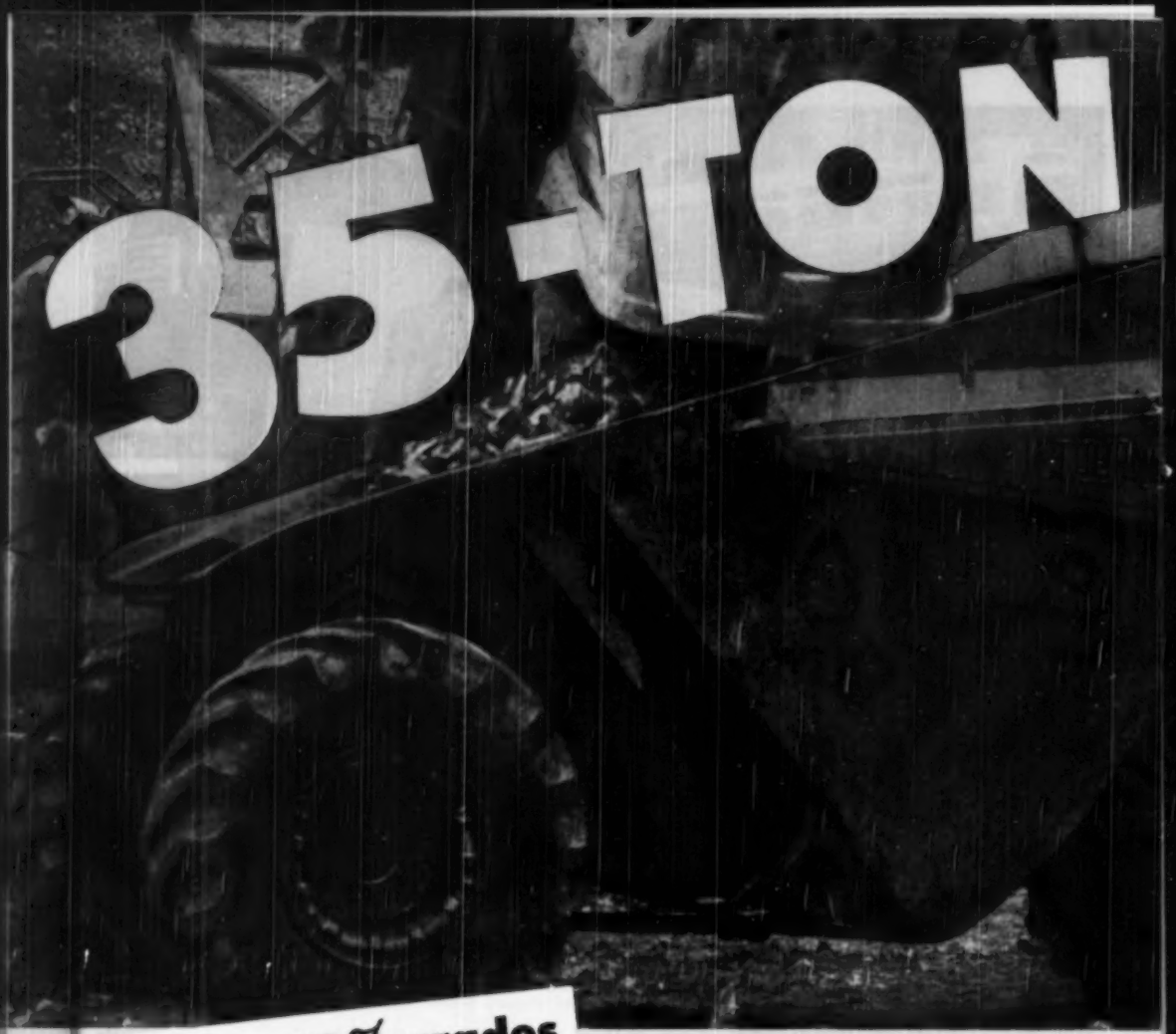
GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

"Your Key to Power Economy"

Only GM Diesels provide all these advantages

Smaller size, less weight per horsepower • Two-cycle smoothness, power on every downstroke • Quick starting, on its own fuel • Unit injectors—no high-pressure fuel lines • Rapid acceleration • Cleaner burning • Better high-altitude performance • Easy accessibility



Hauling up 10% grades ...loads weigh 37½ tons

On bench stripping operations at their Bagdad, Arizona mine, the Bagdad Copper Corporation brought in two 35-ton, rear-dump Tournarockers . . . teamed them with a 4-yard shovel . . . and report the following big-tonnage results:

Each big-capacity LeTourneau rear-dump rock wagon is loaded with 6 to 7 passes from the well-heaped 4-yard dipper in less than 2 minutes . . . and, according to actual weight test, loads carried average 37½ tons. Hauling these oversize loads along narrow benches . . . down 10½% grade for 450 feet . . . then, up 660 feet at 10%, each Tournarocker averages a 4510-foot round trip every 11.2 minutes, including load, haul, dump and return. Giant, 4-wheel air brakes, and positive electric power steer let operators haul in 3rd gear along the benches with complete confidence and safety. On the 10% mine grades, Tournarockers climb easily in second, with full loads. Pull is exceptionally smooth because of power-proportioning differential, which automatically delivers 4 times the power to drive wheel on firmest footing.

On the spoil bank, these husky haulers also show a lot of speed advantages, 90° turns, controlled by push-button electric steer, give fast, easy spotting. Power on front drive wheels lets Tournarocker back up clear to edge and dump over bank . . . eliminates most clean-up. Simple electric

LETOURNEAU PEORIA, ILLINOIS **TOURNAROCKERS**

HIGH SPEED on RUBBER PLUS TRACTION ADVANTAGES of a CRAWLER

TOURNAROCKERS
Speed Stripping for Bagdad Copper

PUTS LOAD OVER EDGE OF BANK

In dump position, back end of Rocker body is below rear wheels . . . bowl rests on edge of bank . . . loads dump clear. Positive holding action of big 4-wheel, disc-type air brakes makes this operation safe. With power on front wheels, drivers are always on firm footing for quick, easy pull-away from edge.

Tournadozer, Carryall, Rooter—Trademark Reg. U.S. Pat. Off. Tournarocker—Trademark M2

hoist raises body to vertical position . . . smooth, streamlined bowl clears the 37½-ton loads in an average of 38 seconds, total hoist and dump time!

Sizes: 50, 35, 16, 9 tons

Like Bagdad Copper Corporation, it will pay you to investigate the big tonnages and new low hauling costs possible on your work with these revolutionary, rear-dump rigs. Remember, too, with every size Tournarocker . . . 50, 35, 16 or 9 tons . . . you have money-saving interchangeability with Carryall scrapers, cranes, flat-beds and many other auxiliary hauled units. That assures greater operating flexibility and steady earnings the year round! Your LeTourneau Distributor has all the facts . . . call him for more information . . . write NOW.

BAGDAD COPPER ALSO USES TOURNADOZER

Rubber-tired Tournadozer is Bagdad Copper Corporation's high-speed handyman. Its 180 "horses" on 21.00 x 25 tires give quick, "run-anywhere" service for clean-up around the shovel, haul road maintenance. Rear-mounted PCU makes it readily available for use with 4-wheel scraper, Rooter, or other cable-operated tools.

Mail today to: **R. G. LeTOURNEAU, INC., Peoria, Illinois**

Send us specs., price and performance data on ☐ 50 ☐ 35 ☐ 16 ☐ 9-ton Tournarockers. ☐ Also send facts on 180 h.p. rubber-tired Tournadozer.

NAME ..... TITLE .....

COMPANY ..... Dept. or Div. .....

STREET .....

CITY ..... STATE .....

LeT

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Other Bethlehem Fastenings for the Mine

RIVETS • U-BOLTS • THREADED RODS • ROOF BOLTS AND ACCESSORIES • STANDARD BOLTS AND NUTS

Check the permissible best suited to your job

	LUMP COAL	FINE COAL	WET WORK	ROCK WORK
RED H* C	✓			
RED H D	✓			
RED H F	✓			
BITUMINITE* D	✓			
RED H A	✓			
RED H L	✓		✓	✓
COLLIER* C		✓	✓	✓
RED H B		✓	✓	✓
HERCOGEL* A			✓	✓
HERCOGEL 2			✓	✓

Fast, slow, or gelatin permissibles . . . Hercules can supply you with the correct explosive for any coal mining need. You can quickly determine which suits your requirements most effectively and economically.

HERCULES POWDER COMPANY 936 King Street, Wilmington 99, Delaware

*REG. U. S. PAT. OFF.

XR50-4

THE GREAT NEW Mid-Century U.S. ROYAL FLEETMASTER

Spear Head Penetration Off the Road—

Never Before! A genuine "on-and-off-the-road tire" for the Truckers of America!

Never Before! Job-fitted tread and side-wall compounds to meet the demands of every free-rolling, deep-traction truck service.

Never Before! Such traction and rolling for these varieties of truck service—to radically cut ton-mile transportation costs.

Mid-Century Truck Tires

UNITED STATES

—with smooth Non-Skid Highway Rolling

"MADE-TO-ORDER" for the Mining Industry!

- **Over jagged roadbeds . . .** to non-skid highway speeds!
- **From snow-swept roads . . .** to hot and dusty highways!
- **Through rocky cuts . . .** up steep slopes to asphalt and concrete!

TODAY'S SUPREME TRUCK TIRE WITH HIGHWAY AND OFF-THE-ROAD TRACTION
never possible before!

★ *Job-fitted tread and sidewall compounds*
★ *Free-rolling tread surface*
★ *SPEARHEAD depth traction*
★ **NON-SKID** ★ **CHIP-RESISTANT**

A PHONE CALL DOES IT! This is another U. S. Rubber achievement—without rival, imitator or comparison. Phone your nearest U. S. Royal Dealer for Complete Performance Proof and your own JOB-FITTED SPECIFICATIONS.

RUBBER COMPANY *America's Largest Makers of Tires*

PARIS MANUFACTURING COMPANY

Announces

THREE *NEW* DRILLS

The PARMANCO Coal Drill will drill 2¾ inch holes at a speed of up to six feet per minute in #5 coal. Equipped with heavy duty truck-type transmission and rear end and a complete hydraulic feed, the drill is operated by one man from the control seat. It is made in two sizes with a 12 h.p. or 25 h.p. gas motor and all units are completely self-contained and enclosed in oil-tight cases.

ALREADY USED by

Big Band Collieries, Inc.	1	Exes Coal Co.	1
United Electric Coal Co.	6	Southeastern Ill. Coal Co.	1
Fairview Collieries Corp.	2	Truax-Traer Coal Company	2
Colonial Coal Co.	1	Refractory Field	
Little Sister Coal Co.	1	Harbison-Walker Refractories Co.	1
Hamm-Sinclair Coal Mining Co.	6	Mexico Refractories Co.	1
Sherwood-Templeton Coal Co.	1	A. P. Green Fire Brick Co.	1

THIS UNIT IS DELIVERING 6-INCH SHOT HOLES — READY FOR LOADING at Better Than Two Feet a Minute ! ! !

The new PARMANCO Hi-Speed Horizontal Drill is completely redesigned around a 40 h.p. engine with four drilling speeds which, in field tests, has cut one-third off the footage drilling time —a cost-per-drilling-foot saving that we are passing on to the strip mine operator and contractor at no increase in our price. In addition the drill is equipped with a starter and generator, dual type front wheels, truck type rear axle with mechanical brakes and a traction drive with both forward and reverse.

PARIS MANUFACTURING COMPANY
Paris, Illinois

The JOY 14-BU Loader is a high production, low vein machine with a capacity up to 8 tons a minute. Produced in heights of 30½", 33" or 36," economical in operation and rugged. Like all JOY Loaders, it is highly flexible, with a chain conveyor that swings 45° to either side.

JOY

LOADERS, CUTTERS, SHUTTLE CARS and MOBILE COAL DRILLS

Illustrated on this page is a typical JOY "team" of high-production mining machines for thin-seam trackless operation. In soft or hard coal—no matter what your mining conditions are—you'll realize greater efficiency and economy with *field-proved* JOY Equipment . . . built by the world's largest producer of underground mining machinery.

11-RU CUTTER

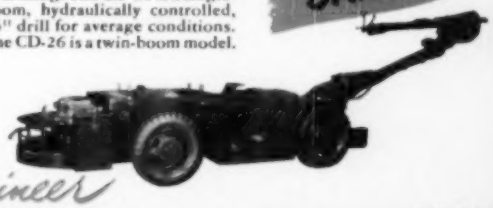
JOY Trackless Universal Cutters—the 11-RU for low coal and the 10-RU for thick seams—are highly maneuverable, fast, hydraulically controlled machines that can make horizontal or shear cuts anywhere in the face.

6-SC SHUTTLE CAR

The JOY 6-SC Shuttle Car is ahead of anything in its class in safety features and operating advantages. Only 29" high for thin seams—has four wheel drive, four wheel steering, hydraulically adjustable elevating discharge.

CD-25 COAL DRILL

JOY Mobile Coal Drills are highly maneuverable, fast-tramming units that feature an exclusive, automatic, infinitely variable control of both rotation and feed in drilling. The CD-25 is a single-boom, hydraulically controlled, 36" drill for average conditions. The CD-26 is a twin-boom model.



Write for Bulletins, or

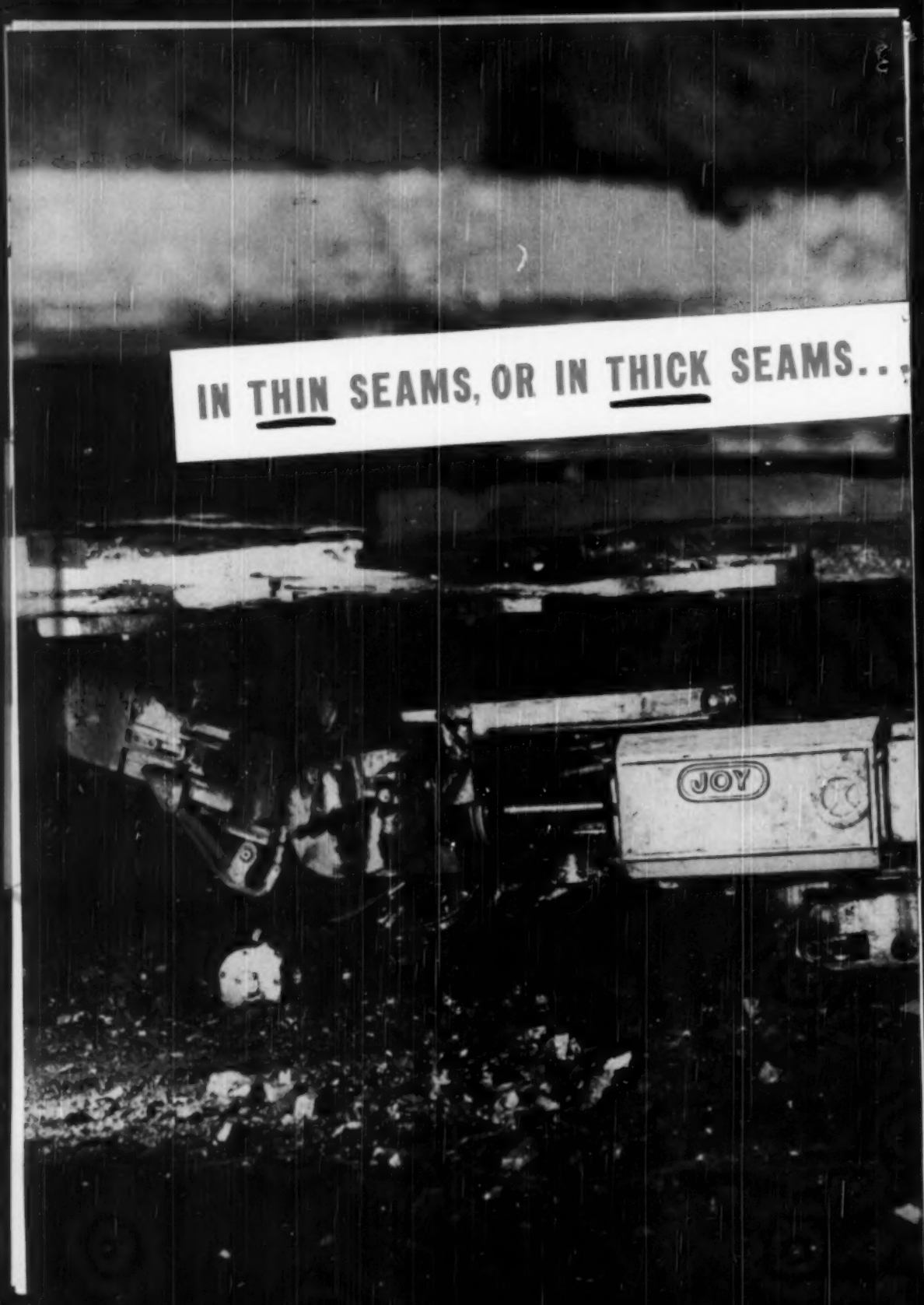
Consult a Joy Engineer

WAD CL 3046

JOY MANUFACTURING COMPANY

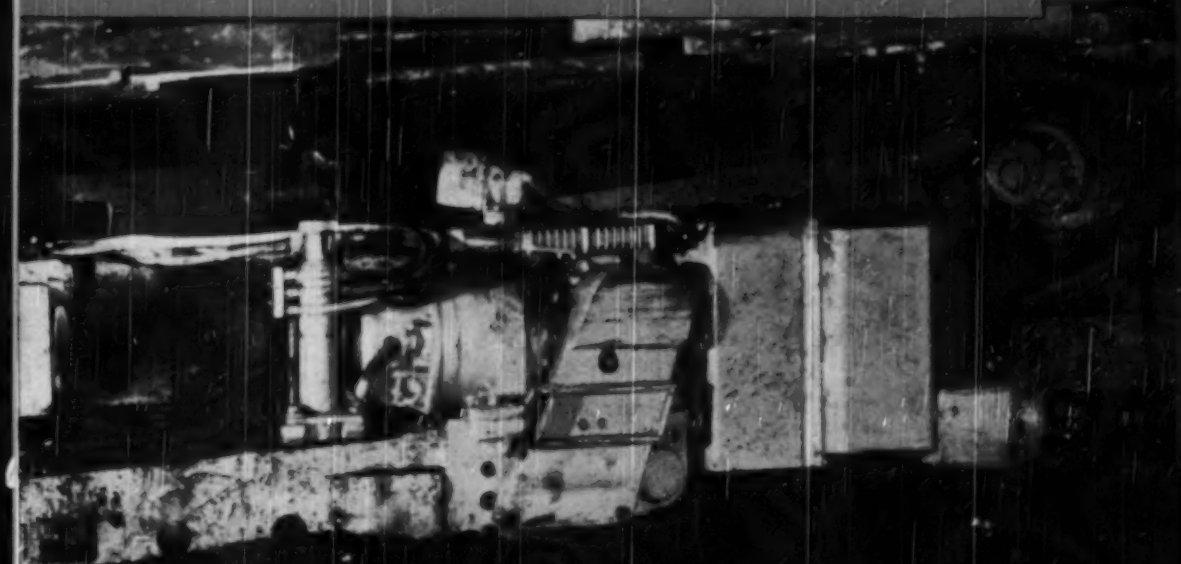
GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO


IN THIN SEAMS, OR IN THICK SEAMS...
JOY

The JOY CONTINUOUS MINER

marks a new era of Efficiency and Low Cost in Coal Mining



3-JCM Continuous Miner, low coal type, at work in the Gorgas Mine of the Alabama Power Co., Gorgas, Ala.

Consult a Joy Engineer

WAD CL80

JOY MANUFACTURING COMPANY

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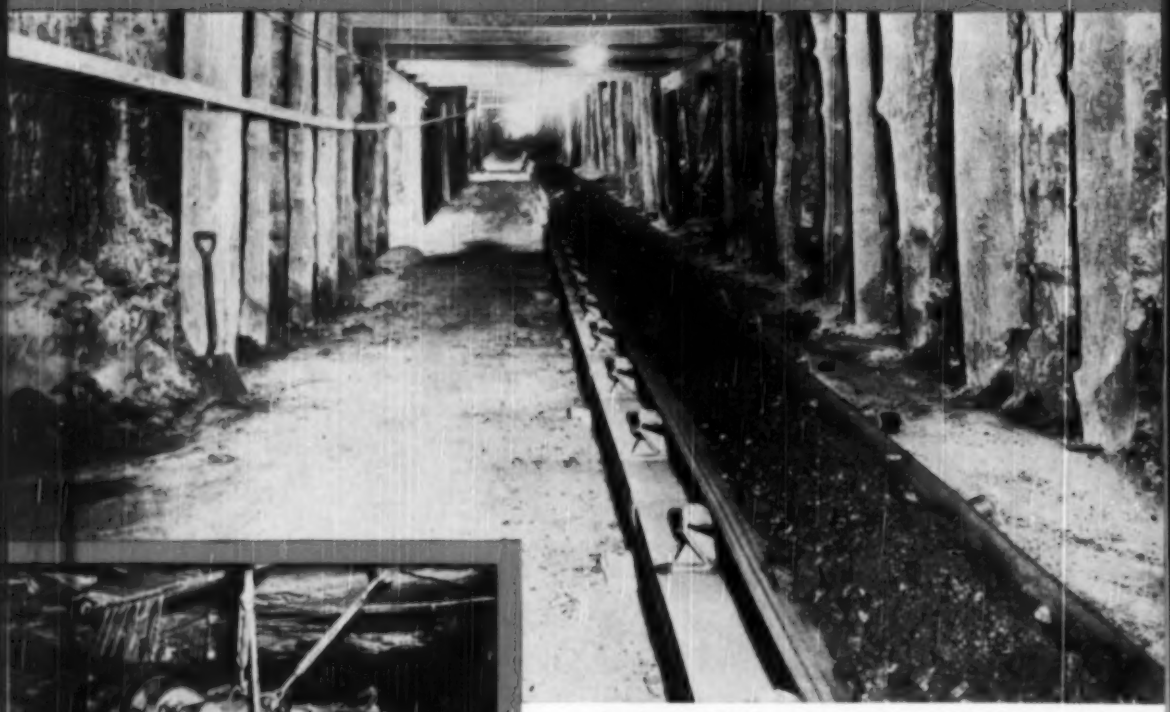
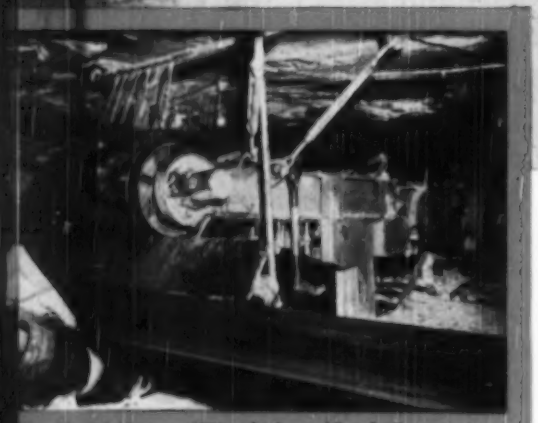
JOY BELT CONVEYORS

YOUR BEST BET IN THE LONG HAUL!



A modern JOY Belt Conveyor is the efficient main haulage in this mine.



Transfer point between JOY gathering and "trailer" conveyors.

★ Designed for LOW MAINTENANCE

★ Built for LONG LIFE

★ Proved for RELIABILITY

For gathering or main haulage systems, you'll find JOY Belt Conveyors most efficient in providing a smooth, continuous flow of coal at minimum cost, and with greatest dependability. Rugged construction and sealed-for-life idler bearings, requiring no lubrication, assure trouble-free operation with low power consumption and the least possible maintenance cost or shut-down time. ● JOY builds a conveyor—belt, chain or shaker—for *every* mining condition. *Write for Bulletins,* or for engineering assistance.

Consult a Joy Engineer

WBD CL2200

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

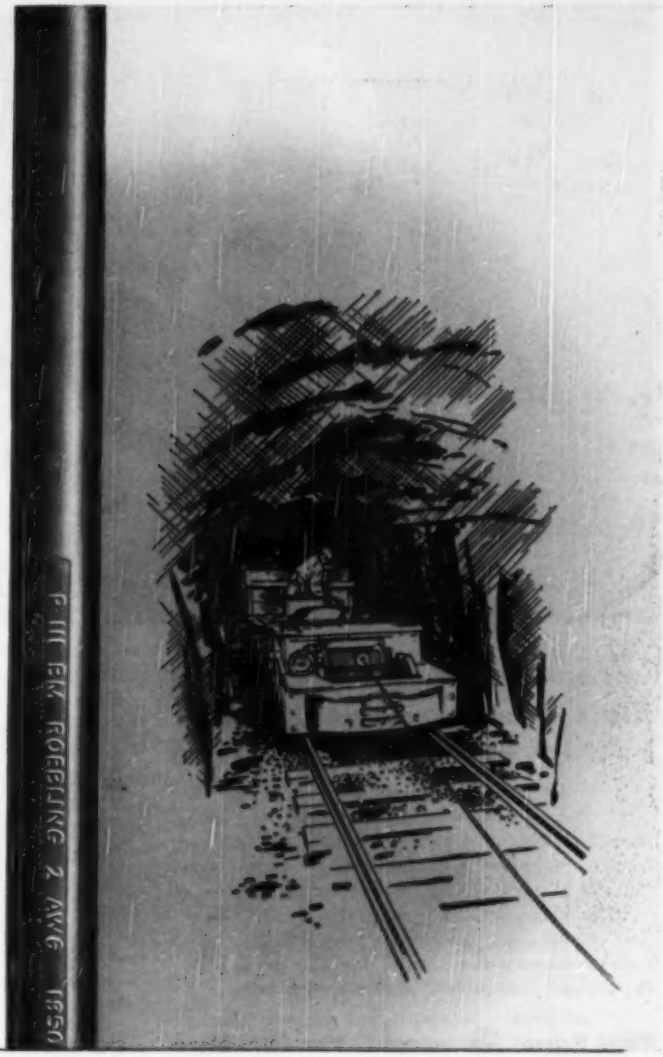
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

More service at lower cost... ROEPRENE Mine Locomotive Cables

THERE ARE A LOT of *extras* in Roebling ROEPRENE Mine Locomotive Cables. Their outer jackets, for instance, are "lead-mold" cured, a special process that makes them more dense, tough and resilient than ordinary jackets . . . better able to withstand light cuts, impact, abrasion, water and grease.

ROEPRENE Mine Locomotive Cables are outstandingly flexible. Their single conductor is insulated with a heat and moisture-resistant compound. The ROEPRENE sheath is bonded permanently to the insulation by open reinforcing cords. They are marked with the inscription "P-111-BM," which indicates approval by the State of Pennsylvania, Dept. of Mines, and full compliance with the requirements of the U. S. Bureau of Mines for flame-resisting mining cables.

There's a suitable Roebling Portable Power Cable for every sort of portable equipment, above or below ground. The *right* cable—your Roebling Distributor will gladly help choose it—will bring you longer working life and brand new economy. THAT'S WHY



Today it's Roebling!

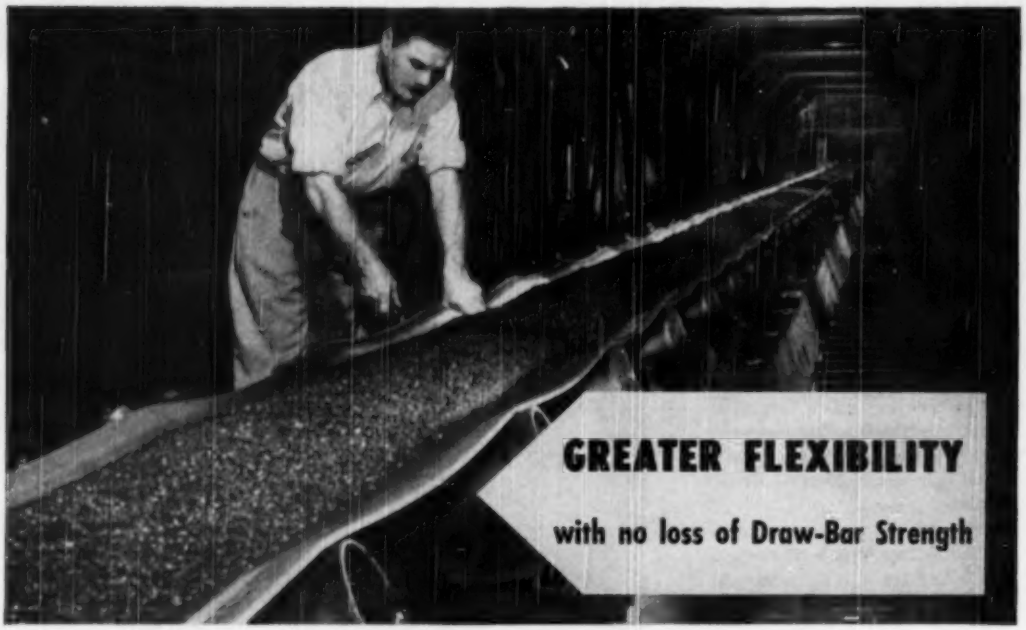
JOHN A. ROEBLING'S SONS COMPANY, TRENTON 2, NEW JERSEY

ROEBLING

A CENTURY OF CONFIDENCE

Atlanta, 934 Avon Ave. ★ *Boston*, 51 Sleeper St. ★ *Chicago*, 5525 W. Roosevelt Road ★ *Cincinnati*, 2353 Fredonia Ave. ★ *Cleveland*, 701 St. Clair Ave., N. E. ★ *Denver*, 4401 Jackson St. ★ *Houston*, 6216 Navigation Blvd. ★ *Los Angeles*, 216 S. Alameda St. ★ *New York*, 19 Rector St. *Philadelphia*, 12 S. Twelfth St. ★ *Portland*, 1032 N. W. 14th St. ★ *San Francisco*, 1740 Seventeenth St. ★ *Seattle*, 900 First Avenue S.

From copper rod to finished cable, all components of Roebling electrical wires and cables are manufactured in Roebling's own plants. Painstaking care, research, engineering and modern precision machines are your assurance of highest quality.

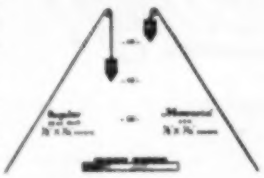


Homocord Conveyor Belt Runs Truer . . . Carries Bigger Loads Without Spilling

Supreme lateral flexibility enables a Homocord Conveyor Belt to trough naturally. It runs truer in the idlers than conventional belts because the Homocord construction makes adequate contact with the center roller at all times. This insures safe transportation of maximum loads without spillage. Homocord Conveyor Belt can be made endless with vulcanized splice or metal fasteners with *no loss of draw-bar strength* over the heaviest conventional duck conveyor belts.

Tests Prove *Homocord* Has 50% More Cushion Against Impact

In a "Guillotine" Test, as shown here, a heavy metal weight ground to a blunt edge is dropped from various heights on samples of belting. When dropped from a height of 40" on a sample of 4-ply 32-oz. duck belt with 1/8" top cover and 1/16" bottom cover, the impact cuts through the cover to the duck. On the other hand, a 4-ply AEH Homocord sample with 1/8" top cover and 1/16" bottom cover begins to show the same impact effect from a drop of 60"—thus proving at least 50% more cushion in the Homocord strength member.



Homocord is priced a little higher but it costs far less on every installation where it is recommended. Customers report remarkable service and tonnage records. If you have not "discovered" Homocord, by all means call your Manhattan distributor or a Manhattan belting engineer and let him show you the greater value in this modern belt.

DO YOU HAVE THIS FOLDER?

Bulletin No. 6906 on Homocord should be in your files.

A copy will be mailed to you, on request.

Ray-Man, New Tension-Master Conveyor Belt for Long Lifts

. . . the first to be engineered with rayon strength members. Recommended where it is desirable to reduce the number of transfer points on a long lift.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive & Diamond Wheels • Bowling Balls

Machine illustrated has Diesel power with electric swing. Also available as full Ward-Leonard Electric machine.

MARION gave the industry a new conception of excavating equipment in 1946 when the MARION 111-M was introduced. Here was a 3½-4 cu. yd. machine with all of the benefits of Diesel power PLUS all of the advantages of electric swing. Big enough for high daily yardage, yet easily moved from one job to another. Power enough to stand up to big jobs without flinching. Heavy enough to be steady on its long, wide crawlers.

Now—the MARION 111-M is bigger and stronger—better than ever. It is a thoroughly field-proven machine, piling up performance records that are truly impressive. (Write for copies of letters from 111-M owners.)

Regardless of whether you have seen the MARION 111-M before, you should see it today if a 3½-4 cu. yd. machine has a logical place in your operations. It's a rugged, heavy machine as a shovel or dragline with power and strength to spare.

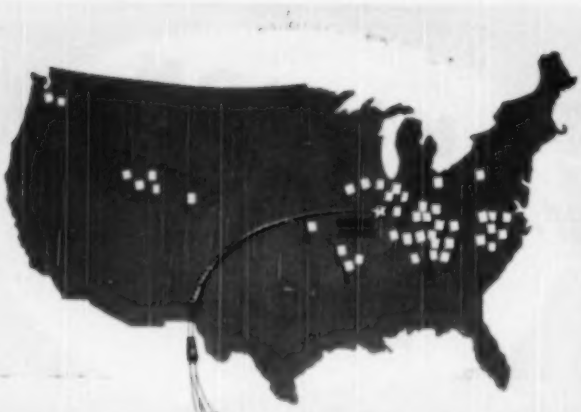
The 111-M is an important new tool for heavy-duty material handling. Get the full story from your MARION representative or write to the factory for information.

MARION

POWER SHOVEL COMPANY

MARION, OHIO, U.S.A.

Offices and Warehouses in all Principal Cities • Established 1884



PUBLIC BENEFACTORS

wherever a coal preparation plant goes into production, everybody benefits

Danville, Illinois, Hazmattan Coal Preparation Plant of the Ayrshire Collieries Corporation.

One of the latest links in this nationwide chain of coal preparation plants

During 1947 and 1948, forty-three McNally plants, with capacity of 13,365 tons per hour, have been erected . . . are now in the shop . . . or under construction on location. These plants stand as symbols of better business and today's better living.

Each plant brings an increased volume to its trading area. To the coal user, the satisfying performance of clean, premium-value coal . . . to coal operators, assured markets for specification fuel . . . to workers, laborsaving conveniences and more comfortable working conditions . . . to profit-minded executives, a good return on their investment.

The service of our consulting engineers is offered to you without cost or obligation.

McNALLY PITTSBURG

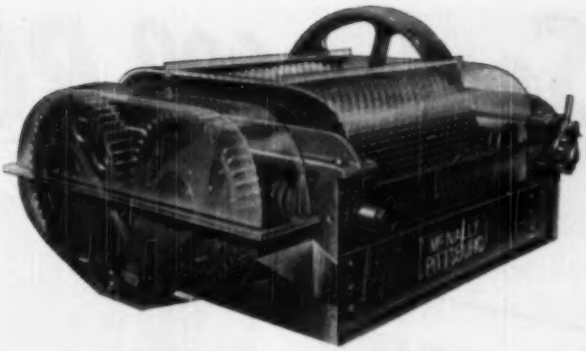
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation, *Manufacturing Plants*: Pittsburg, Kansas • Wellston, Ohio

Engineering and Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio

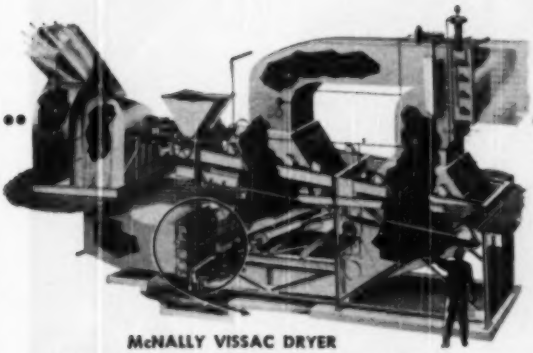
McNALLY PITTSBURG

engineering service and equipment set new standards for production and profit.



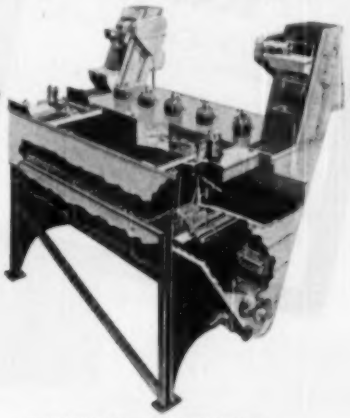
GEARMATIC STOKER COAL CRUSHER

Stoker Coal Crusher for accurate sizing, high production, plus a low percentage of fines. Outstanding features include interlocking tooth segmental crusher roll and full floating Gearmatic Drive. Capacities up to 300 tph.



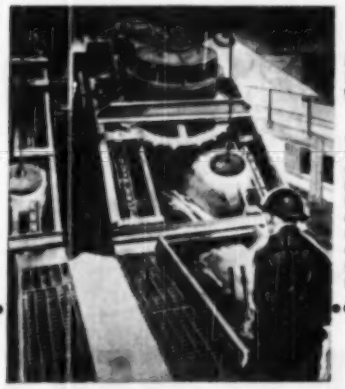
McNALLY VISSAC DRYER

In the first phase, coal is clamped to the screen, squeezing out the free water by mechanical pressure. In the following phase, hot gases flow through the coal, evaporating the moisture. A down draft dryer especially economical for large tonnages.



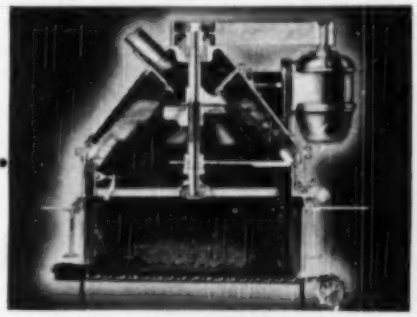
McNALLY NORTON WASHER

Automatic mechanical controllers assure positive separation of coal from non-combustible material and produce uniformly clean coal under all conditions of feed. Specific gravity of washed coal adjustable to any predetermined product. Washes sizes up to 8". Available in models 25 to 450 tph. Fully described in Bulletin No. 216. Ask for it.



McNALLY RHEOLAVEUR WASHERS

Clean coal is produced by stratifying a moving bed in a stream of water. Actual service in plants proves that this washer delivers a coal of consistently low ash and low sulphur content. Separate systems for coarse and fine coals.



McNALLY CARPENTER DRYER

Flexible centrifugal unit that makes continuous drying possible. Celebrated for high-water removal, small loss of product in effluent, and low maintenance. Especially efficient in drying minus ¾" sizes.

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

Scalps 400 tph ROM Coal

HEAVY-DUTY
RIPL-FLO
SCREEN
Handles ROM coal and rock in largest sizes.
Has only two bearings to lubricate instead of four.
Screen surface bolted to rigid flat surface I-beams.
Sizes 4x5 to 6x16 ft — one, two or three decks.

HERE, AT Enoco Collieries, Bruceville, Indiana, this 5x10 ft Extra Heavy Duty *Ripl-Flo* vibrating screen handles 400 tons per hour, scalping ROM coal.

The heavy perforated top deck has 6-in. round openings, with oversize going to a breaker and minus 6-in. product to wash boxes or raw coal classifying screens.

Owners are pleased with performance . . . and with the negligible amount of maintenance required.

Heavy Duty *Ripl-Flo* screens are made of high tensile steel, and are of all-welded construction, "stress-relieved" to eliminate strain around welds. Replaceable liner plates above the deck protect the side plates from wear.

The Allis-Chalmers representative in your area will be glad to show you how A-C vibrating screens may fit into your operations profitably. Call him, and write for **Bulletin 25B2680A,** describing all Allis-Chalmers equipment for coal.

A-3129

ALLIS-CHALMERS, 968A SO. 70 ST. MILWAUKEE, WIS.

AVAILABLE WITH RUBBER FLOOR MOUNTINGS

The entire line of *Ripl-Flo* screens can be obtained with rubber mountings instead of cable suspension.

Ripl-Flo and Texrope are Allis-Chalmers trademarks.

ALLIS-CHALMERS

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Motors

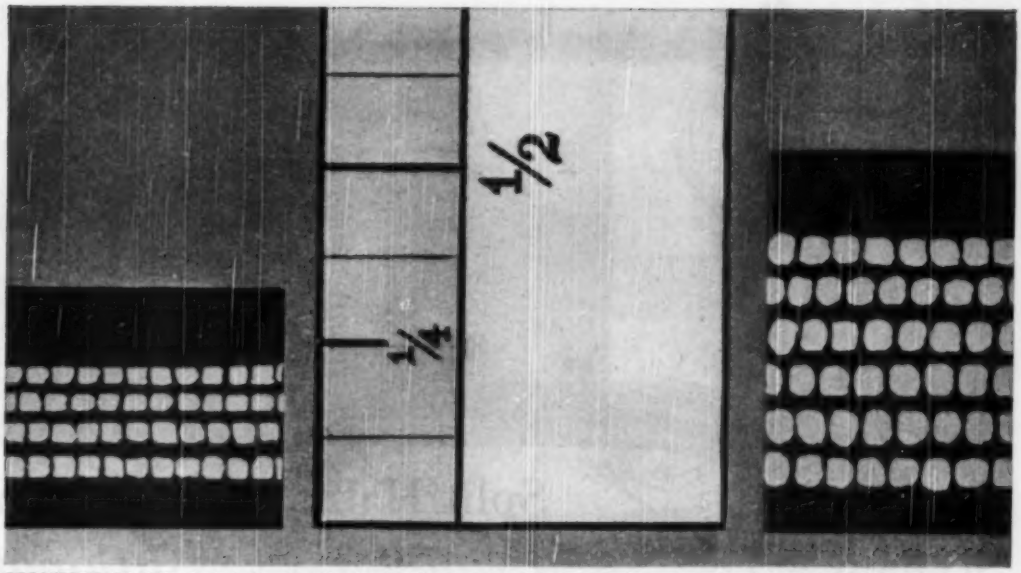
Controls

Texrope Drives

Vibrating Screens

Crushers

Kilns, Coolers, Dryers



GREATER STRENGTH of belts built with "Cordura" is illustrated above (enlarged in scale to show detail of construction). At left is cross-section of four-ply belt sinewed with "Cordura." It's stronger than conventional six-ply belt at right, yet only half as thick. This thin, light belt is particularly desirable where panel equipment is moved frequently.

WILL YOUR NEXT CONVEYOR BELT HAVE THESE FEATURES?

Here are four operating advantages you can have built in your next conveyor belt simply by asking your supplier to build it on Du Pont Cordura* High Tenacity Rayon. This is the industrial yarn that gives strength to heavy-duty truck tires and lightweight high-pressure hose. And it makes a stronger and easier-to-operate belt . . . at no extra cost.

We will be glad to send you the names of suppliers of these efficient belts. You can also get full information about "Cordura" in the new manual "Sinews for Industry." It gives physical properties of "Cordura" rayon, describes many successful applications and tells how "Cordura" improves the efficiency of conveyor systems. For your free copy, address Room 4527, Rayon Division, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

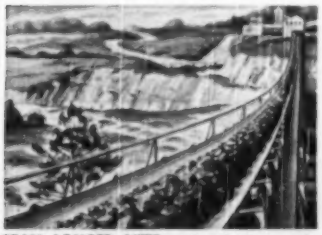
*Reg. U. S. Pat. Off.

DU PONT "CORDURA" HIGH TENACITY RAYON

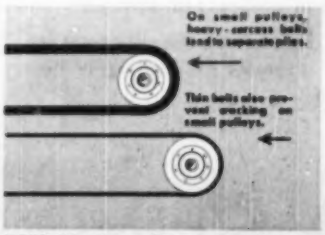
DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

for RAYON . . . for NYLON . . . for fibers to come look to DU PONT



SPAN LONGER LIFTS. The high tensile strength of "Cordura" rayon eliminates costly transfer points. For example, a belt reinforced with seven plies of "Cordura" can lift 1000 tons of overburden per hour up a 15° slope over 1000-foot centers. It has design tension of 900 pounds per inch of width.



MORE FLEXIBILITY. Belts built with "Cordura" have less tendency to crack and separate plies when run over small pulleys required in confined working space. And belts built with "Cordura" have less stretch, so less take-up room is needed. And they trough well under any loading conditions.

HEAVIER LOADING CAPACITY is possible on conveyor belts built with Du Pont "Cordura" High Tenacity Rayon. This yarn is inherently stronger than the natural fibers commonly used. It packs extra strength into conveyor belts and enables them to carry loads to the capacity of power equipment.

Split Half a Second into Sixteen Parts . . . *and you get a sensational improvement in blasting methods!*

Here's a picture that shows WHY the ROCKMASTER Blasting System pays off! Notice the rock in motion. And yet the explosive gases are held within the burden. No spectacular "spouts" of gas going to waste. Result: Greater explosives efficiency, better fragmentation, less vibration, greater safety.

In a ROCKMASTER blast, holes are electrically fired at controlled split-second intervals. The timing is in each electric blasting cap. The ROCKMASTER "16" series offers you a choice of sixteen millisecond delay detonators, all starting together, all firing at timed intervals in a little over half a second!

For rock, coal, ore—on the surface or underground

Your job may call for two, three or all sixteen ROCKMASTER detonators. We help you select them to fit your job. Drill pattern and explosives are based on what you want to accomplish. Many times, this means important savings in drilling and dynamite.

Write for your copy of the booklet on the ROCKMASTER "16" Blasting System. It includes diagrams for loading in quarrying, stripping, mining, construction.

Less Bark *More Bite*

ROCKMASTER "16" TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

ROCKMASTER: Reg. U. S. Pat. Off.

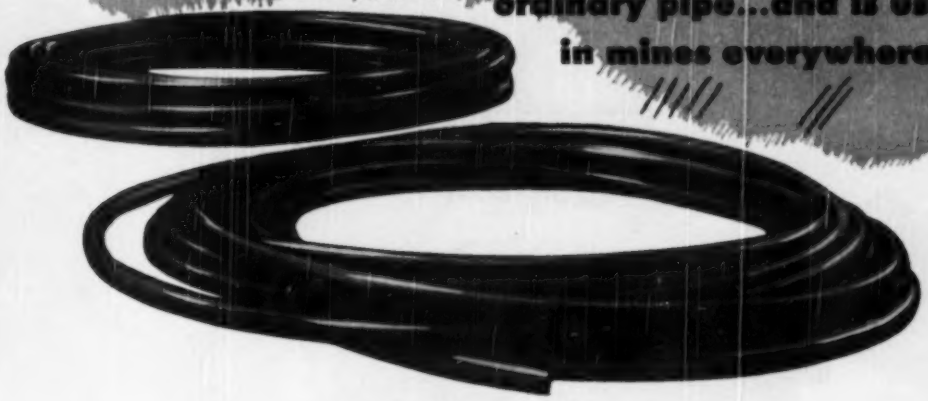
ATLAS EXPLOSIVES *"Everything for Blasting"*

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

JOHNSONITE!

The plastic pipe that bends ...is 13 times lighter than ordinary pipe...and is used in mines everywhere



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CHAGRIN FALLS, OHIO • PHONE MIDDLEFIELD 22111 **CORPORATION**

NEW and Heavy-Duty Engineered

TO SAVE YOU MONEY

Whether you haul coal or crushed rock, sand or gravel

You get lower-cost performance, more miles of trouble-free hauling, and longer life from every new International Truck because every new International Truck is HEAVY-DUTY ENGINEERED.

Proof of this statement boils down to this:

1. Heavy-duty truck buyers keep records of hauling costs right down to the last penny. On the basis of what these records show, these cost-conscious men have bought more heavy-duty International Trucks than any other make for 18 straight years.
2. The extra values that for almost two decades have assured America's most exacting truck buyers of better performance at lower cost per mile are engineered into every new International Truck from the smallest to the largest.

Every new International Truck from 4,200 to 90,000 pounds gross vehicle weight offers heavy-duty engineered stamina and operating economy combined with new comfort and ease of handling.

You get new comfort and driving ease in the "roomiest cab on the road." Step into the Comfo-Vision Cab and discover how much more "move-around room" there is in the "roomiest cab on the road." Note how easy it is to adjust the wide seat to just the right position.

Look out through the one-piece, scientifically curved Sweepsight windshield. Place your hands right where they feel natural for driving—and you'll find them gripped around the sturdy steering wheel. And just wait till you start going—you'll enjoy more positive control . . . thanks to new Super-steering.

You get more all-'round truck value in every new International Truck. See the new valve-in-head truck engines, new rear axles, new features throughout—all proved under actual operating conditions. Get the facts about new Internationals—the world's most complete line of trucks.

See for yourself . . . see your International Truck Dealer or Branch, *soon*.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

ALL NEW, ALL PROVED

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY CHICAGO

BOWDIL

COAL CUTTER CHAIN and BITS

ONE-PIECE BIT HOLDER

BOWDIL BITS

BIT-CARRYING BODY SECURELY WELDED TO CHAIN

HEAVY SHOULDERS ON LINKS CARRY LOAD

SET SCREW LOCKS BIT HOLDER

LARGE HEAT-TREATED PINS

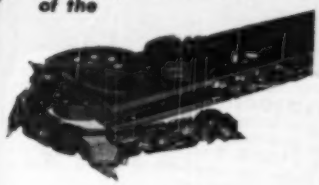
HEAVY-WALL HARDENED BUSHING

RADIAL TRACK GUIDES

DROP-FORGED LINK AND CONNECTOR

INGENIOUS RIVET LOCK

Made by the makers of the



STRONGEST CUTTER-BAR IN THE COAL INDUSTRY

THE BOWDIL COMPANY

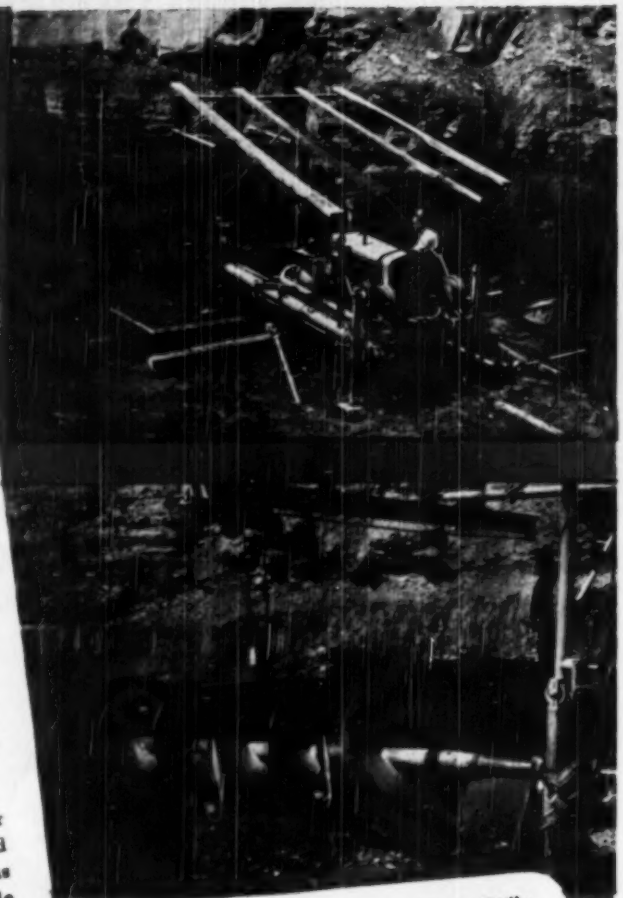
CANTON, OHIO

When Recovery Costs Are OVERBURDENED

CARDOX-HARDSOCG DIRECT MINING DRILLS

When overburden removal becomes too costly for further profitable stripping, it's not necessarily the signal to abandon operations. In just such conditions, the CARDOX-HARDSOCG Direct Mining Drill has enabled many mines to continue economical coal production.

These units, designed specially for the purpose, drill into the seam and bring out the coal in a continuous stream. Teamed up with portable conveyors (see illustration), they provide facilities for automatic loading of trucks.



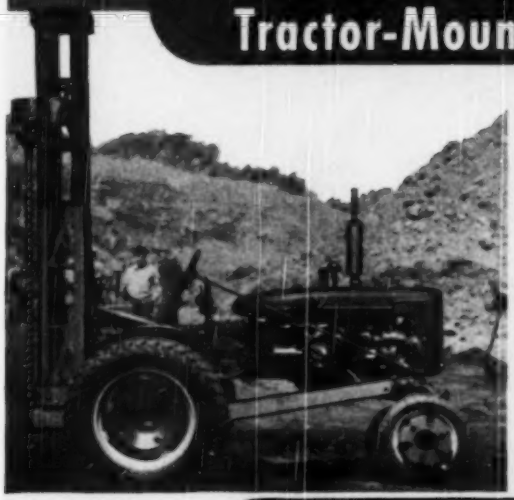
CARDOX-HARDSOCG Direct Mining Drills handle augers up to 40 inches in diameter. Augers to 24 inches are powered by a 32 H. P. engine; larger augers by a 100 H. P. or larger engine. All Direct Mining Drills are available with electric motor drive for underground use.

Augers are in 6-foot lengths that can be quickly coupled. The maximum depth of the drill hole ranges up to 90 feet, depending upon the diameter of the auger and the type of coal.

NEW MULTI-USE DRILL

reduces costs on many kinds of drilling

CARDOX-HARDSOCG
Tractor-Mounted Vertical Drill

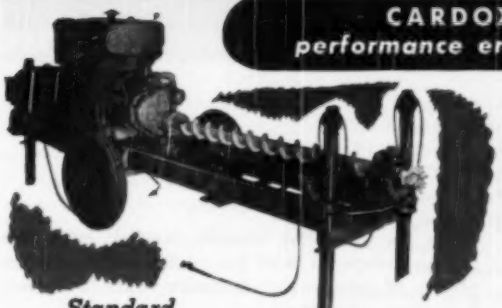


One Unit Handles All of These:

- Rapid Drilling of Stripped Coal
- Crop Line Testing
- Foundation Testing
- Core Drilling

Here's a whole drilling combination in a single economical package! Furthermore, because of its powerful tractor drive you can use this drill in rugged terrain where use of other types of drilling equipment is difficult or impractical. It saves you time on the job — and between jobs — moves from hole to hole or from one site to another with full tractor mobility. The drill is driven by the power take-off of the tractor engine. It easily drills holes up to 6 inches or more in diameter. The augers are in 6-foot sections, available with any standard connections. The unit can be converted from one type of drilling to another in just a few minutes.

CARDOX-HARDSOCG DRILLS
performance engineered to stay on the job!



Standard
HYDRAULIC HORIZONTAL DRILL

Fast on the job — easily towed or trucked from job to job. When set up in a pit it can be readily moved from hole to hole by the operator and a single helper. Available with either air-cooled gasoline engine or electric motor. Standard equipment includes seven 5¼" diameter, 6' auger sections for drilling up to 42' in depth. Regular hard-surfaced bits or tantalum-tungsten-carbide cutterheads may be used.

CARDOX-HARDSOCG Hydraulic Horizontal Drills may also be had in self-propelled models—gasoline or electric powered.

Standard
VERTICAL DRILL

In the production of coal, clay, gypsum, asbestos and other minerals, users report as many as 110 holes, each 10' deep, drilled in a single day! May be had with air-cooled gasoline engine or electric motor. Weight of the engine or motor forces the auger and cutterhead into the material being drilled. The mast is easily lowered for towing from job to job. The 6' augers may be quickly coupled for drilling deeper holes.

CARDOX-HARDSOCG Vertical Drills are also available in heavy-duty model for very tough, deep drilling jobs.

There's a CARDOX-HARDSOCG Distributor or Representative near you. He can help you step up efficiency and cut your costs. Call upon him *first* whenever you need any kind of drilling equipment.

Add Up the Savings with

Gulf Mining Machine Lubricant

1. lower maintenance costs
2. reduced out-of-service time
3. simplified lubrication storage and handling

$ _____ *your total savings*

1. Gulf Mining Machine Lubricant eliminates lubricant throwoff and channeling, prevents the entrance of abrasive coal dust in gear cases, reduces wear, and resists the washing action of water. As a result, repair and replacement costs go down and stay down.

2. Improved lubrication with Gulf Mining Machine Lubricant means fewer breakdowns, less time in the shop—which add up to greater tonnage.

3. With just this one lubricant—Gulf Mining Machine Lubricant — you can do the entire lubricating job on most types of mining machines. Thus you eliminate 2 or 3 other lubricants, insure less confusion at the face, prevent application mistakes.

To get the many benefits possible with this quality lubricant, and for expert help on other phases of improved lubrication, call in a Gulf Lubrication Engineer.

Gulf Oil Corporation · Gulf Refining Company

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Located in principal cities and towns throughout Gulf's marketing territory

GULF INDUSTRIAL LUBRICATION

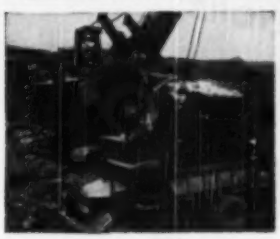
J. Robert Bazley Inc. finds Jalloy Heat-Treated Steel Plate

Pays off in Maintenance Savings

J&L STEEL

Welding Jalloy wear plates between tooth bases on an Esco drag bucket.

Heat-treated Jalloy bed liner plates and reinforcing strips cut deadweight—increase service life in this Euclid.



Patty Dennery, Supt., (left) and Pete Ambrose, foreman, discuss using heat-treated Jalloy to reinforce a drag bucket.

Equipment Downtime Cut . . . FEWER MAN-HOURS SPENT ON REPAIR . . . COST OF STEEL FOR MAINTENANCE LOWERED AND UNIT PRODUCTION INCREASED WITH TOUGH J&L JALLOY HEAT-TREATED PLATE

J. Robert Bazley, Inc., Pottsville, Pa., stripping and construction contractors, knows that high equipment maintenance costs can drain the profits right out of an operation. That's why they've standardized on heat-treated Jalloy plate for wear and reinforcing plates on equipment where impact and abrasion determine the service life of steel.

On Bazley's equipment, which includes 30 shovels and draglines, 36 Euclid trucks and approximately 95 other earthmoving pieces, heat-treated Jalloy applications include:

- **Three-eighths-inch plate for truck body liners, reinforced with ⅝" strips 5" wide spaced on 11" centers. The ⅜" Jalloy liner replaced ½" high-strength steel, resulting in a weight saving of 500 lbs. per truck bottom.**
- **Three-quarter-inch wear plates between drag-bucket-tooth bases, 1" plates on side cutting edges and ¾" shoes where sides join bottom of bucket.**
- **Other uses include dozer-blade corner plates and grader scraper teeth.**

Result?—J&L *heat-treated Jalloy lasts 4 to 6 times as long as mild steel previously used.*

Why not check into J&L Jalloy, the steel that's produced exclusively by J&L to meet the needs of mining and quarrying men. Write today for your free copy of our booklet, "For Longer Wear . . . Less Repair—Jalloy J&L Special Alloy Steel." It'll give you the facts on Jalloy and tell you how others are saving money with this really tough mining steel.

Jones & Laughlin Steel Corporation
411 Jones & Laughlin Building
Pittsburgh 30, Pa.

Please send me a copy of your free booklet, "For Longer Wear . . . Less Repair—Jalloy J&L Special Alloy Steel."

Name_____

Company_____

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JONES & LAUGHLIN STEEL CORPORATION

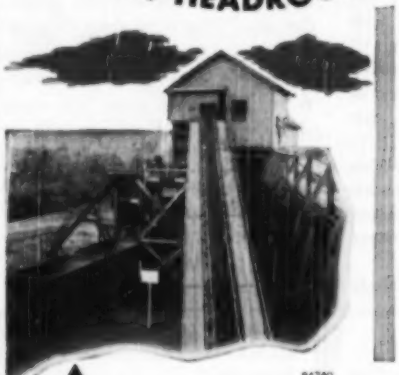
From its own raw materials, J&L *manufactures a full line of carbon steel products, as well as certain products in* OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

LOW HEADROOM..HIGH EFFICIENCY CONVEYORS...

Standardized

for easy assembly and relocation



You can cut the cost of getting the coal out of these low seams with simplified, "standardized" B-G channel-frame belt conveyors. These B-G *pre-engineered* underground conveyors come to you clearly marked for quick and easy assembly—are simply disassembled, relocated with a minimum loss of working time. Rugged channel frame has skid legs for low head room mounting on the floor, holds smooth rolling B-G Carriers in true alignment . . . To cut costs now, why not see your B-G Distributor about these widely used mine conveyors?

(Left) Less assembly time, less "blueprint work"—B-G Mine Conveyors (Channel or Truss Frame) with complete accessories—carriers, take-ups, drives, A-frames, etc.—are designed for maximum interchangeability, greatest ease in selection and erection. Assembly-tested at the factory!

BARBER · GREENE COMPANY AURORA, ILLINOIS

Constant flow Equipment

LOADERS | PERMANENT CONVEYORS | PORTABLE CONVEYORS | COAL MACHINES | BITUMINOUS PLANTS | FINISHERS | DITCHERS

EATON

2-Speed Truck

AXLES

Give More Pay-Load Miles at Lower Cost per Mile

Trucks equipped with Eaton 2-Speed Axles make fewer stops for gas and oil. That's because these Eaton Axles double the number of available gear ratios in any truck, thus permitting the use of the most efficient ratio for every driving condition. As a result, the engine operates at economical speeds—doesn't strain and struggle on hills or when starting under full load . . . runs effortlessly on the straight-away. This means, too, that stress and wear on engine and major power transmission parts is minimized. These operating and maintenance economies—plus the higher trade-in value of Eaton equipped trucks—enable Eaton 2-Speed Axles to more than pay for themselves on trucks of the 1½ ton class and larger. Ask your truck dealer to show you what this means to you.

Axle Division

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

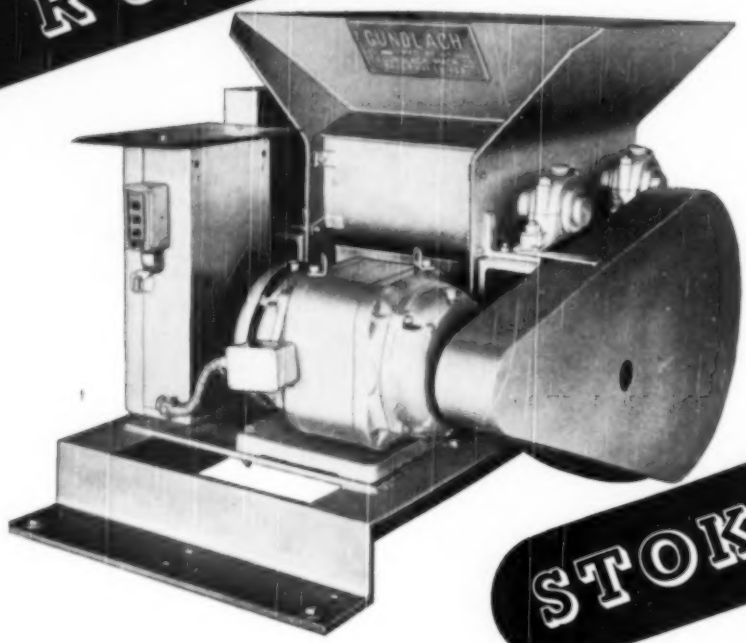
EATON

PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

FROM MINE RUN TO STOKER COAL WITH "*Two Stage*" CRUSHING IN ONE MACHINE!

MINE RUN

The GUNDLACH "*Two Stage*" Coal Crusher incorporates two crushing stages in one machine and is designed to reduce RUN-OF-MINE to STOKER COAL in ONE operation. Compact design simplifies structural supports and installation. Rugged simple construction combined with engineering proved in the field makes this machine a profitable and reliable unit.



STOKER

- Crushing rolls are STEEL, hard faced and balanced.
- All gears are steel cut; Timken roller bearings used throughout.
- Furnished with electric, gasoline or diesel power unit.
- Weight approximately two tons. Height 42" Width 47" Length 6'3" (Electric power unit)

Fulfilling an urgent need in the industry, the GUNDLACH "*Two Stage*" Crusher has delivered over 85% usable stoker coal from an Illinois mine run lot.

WRITE TODAY FOR COMPLETE DETAILS AND CRUSHER BULLETIN GC-2.

T. J. GUNDLACH Machine Co., Belleville, Ill.

Here's Where *SPEED* PAYS OFF!

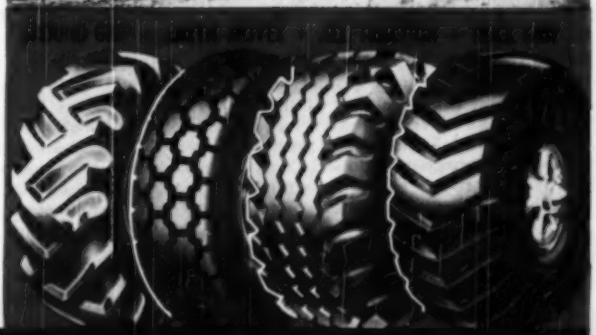
YOU CAN MOVE BIG LOADS *FASTER* on Firestone TIRES

SPEED on the job means profit on the job. You know how much more money you make when you move big loads fast — without profit-killing down-time.

You pile up yardage faster and cut the down-time with Firestone Tires on your equipment. Because their treads are so designed to provide greater productive efficiency and the cord body so engineered to stand up under big loads and high speed operations, Firestone Tires take the roughest punishment and still keep your payloads moving.

The records of off-the-highway operators the country over prove this, and you can prove it too by giving Firestone Tires a trial on your equipment. Let your Firestone Dealer or Store give you all the facts and show you how Firestone Tires will cut your expenses and step up your profits.

Listen to the Voice of Firestone on radio or television every Monday evening over NBC



Copyright, 1950, The Firestone Tire & Rubber Co.

WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES SPECIFY FIRESTONE OFF-THE-HIGHWAY TIRES

SIZE MAKES NO DIFFERENCE...

NOW, ALL S-D 1-2-3 "AUTOMATICS" ARE COMPLETELY SEALED...

Whether it's a 1½ or 30 ton car, all S-D 1-2-3 "Automatics" are now completely sealed against coal dust leakage. Because of a simple "Dust-Roof" seal over space between doors and frame, and with a new patented sealed hood over wheels, coal dust cannot sift down onto tracks with SD "Automatics." These dust sealed cars save operators thousands of dollars every year in track clean-up costs. SIZE MAKES NO DIFFERENCE. For example, the 8-wheel S-D "Automatic" above is 30 ft. long, 8 ft. wide and 6 ft. 2 in. high above rails and hauls 25 tons of coal. The other car with 12 ft. sides, 6 ft. 4 in. width and 20 in. height, hauls 2 tons of coal. Both are completely sealed.

CONDITIONS MAKE NO DIFFERENCE. All S-D "Automatics" are custom built to meet your requirements. Only fundamentals are the same. Each car automatically discharges its load . . . dumping on the move, and can fill your bin level in case of breakdown beyond the bin. Each car has the exclusive S-D, safe, under-the-car Jerk-out latch mechanism. S-D "Automatics" lead a comparatively easy life and repairs are seldom required because they are not subjected to the damaging strains of being lifted or turned over for dumping. For more actual dollar returns on the investment, SD "Sealed Automatics" are, by far, your best buy!

25 TON
5 TON
10 TON
30 TON
6 TON
12 TON

Sanford-Day Iron Works
KNOXVILLE TENNESSEE

ONE OF THE World's Largest Makers of Combines

to design V-Belt DRIVES on newest Combine

A V-Belt Driven Combine . . . Every drive of the most advanced design

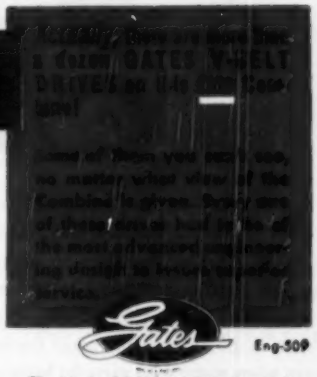
In order to reduce the wear and tear of operating his combine, the manufacturer wanted every moving part that was subject to shock to be "cushioned" by the **shock-absorbing** properties of a V-belt Drive—and he wanted to be sure that every V-belt Drive embodied the most advanced engineering design.

He knew that the Gates V-Belt testing laboratories are by far the largest in the world—that Gates runs an average of 32,000 hours of testing every **week** on V-Belts alone! (32,000 hours is equivalent to five years of life for one belt.)

And he knew that Gates hadn't stopped with testing—that Gates Research Engineers had actually reduced the **results** of these tests to **usable data** for the design of every V-belt Drive.

This intensively SPECIALIZED Research has naturally given Gates Engineers a most advanced knowledge of V-Belts and V-Belt Drive Design—and the benefit of this advanced knowledge and experience is available to **you, right in your own plant, any time you want it!**

Whether you have a difficult drive to design—whether some V-Belt drive in your plant is giving trouble—or whether you merely want to know what size and construction of V-Belts will give the most efficient and the lowest cost service on a particular drive—you have only to phone a Gates Engineer.



The Mark of SPECIALIZED Research

There is always a Gates Field Engineer near you in all industrial centers. Just look in your phone book under "Gates Rubber." He will come to you promptly—and he will put at your service the full benefits of Gates unrivaled V-belt knowledge and experience **without the slightest obligation!**

GATES VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 11 Foreign Countries

Which wire rope dollar buys the most service?

Isn't it true that when you purchase wire rope, you're actually buying service? Buying what the wire rope will do for you? Buying units of work?

The rope dollar that buys the most units of work has been wisely spent. Can you tell which brand of rope is giving you the most for your money? There are many users who can—by keeping records of wire-rope performance. They know what constitutes good, average service in terms of ton-miles, yards of rock moved, etc. When a certain brand gives better-than-average service over a period of years, they know they're getting a big return on the dollars spent for that brand.

Their figures prove it. That's why Bethlehem urges the keeping of records—records that show rope costs per unit of work. For we feel that in any such comparisons, Bethlehem rope will stand out from the crowd . . . in a way that will please the user's pocketbook.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

LET YOUR RECORDS TELL YOU!

JOY SAFETY CIRCUIT CENTERS and "SPB" BIGUN CONNECTORS

Complete Line Available

All SCC units are equipped with "Mines" Connectors—moisture, oil and wear-resistant—available in a complete range of sizes and types.

Above: Low Height SCC with Permissible Housing, for thin-seam gaseous mines. Single and multiple-outlet types.

Above: Full Height SCC with Dust-Resistant Housing. The Permissible unit for high coal is shown in unit, top of page.

Right: Low Height SCC with Dust-Resistant Housing, for entries and non-gaseous operations in thin seams.

Here is *packaged* wiring—"Mines"-built Safety Circuit Centers used with "Mines" Electrical Connectors for individual power take-offs—by far the best and most efficient power distribution system for modern mining machinery. These SCC units not only give you maximum protective value, but maximum productive machine time as well . . . and they're fool-proof, trouble-free, and completely portable. Built in low or high coal models, with permissible or dust-resistant housings, in sizes and current ratings to match any mining requirement. ● *Let us show you how "Mines" SCC units and Connectors can give you another boost on the road to greater production and lower costs!*

WAD ME 3042

Consult a Joy Engineer

for complete details and prices

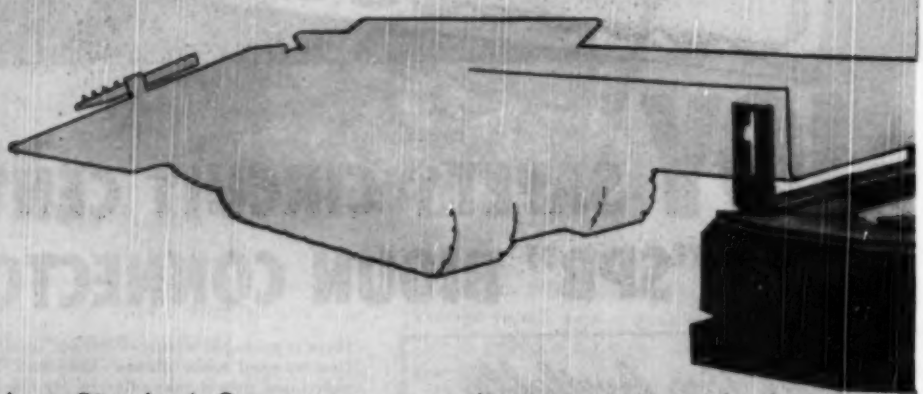
MINES EQUIPMENT MINES *Division*

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

A Basic New

- ★ **Automatically follows the loader to which it is attached.**
- ★ **Full 180° pivot at both receiving and discharge ends—centers load, no spillage.**
- ★ **Maximum telescopic action permits long advances between pan-ups.**
- ★ **Can be used with your present loader with simple modification.**



With the Long Piggyback Conveyor you can realize true continuous loading under practically every condition found in underground mining—unit output can be more than doubled! Fully automatic in action, Piggyback requires no attention whatsoever in operation—no manual moving, no manipulation of controls. The loading machine operator is able to devote his entire attention to loading coal—no delays for haulage—operator never needs to look back. Piggyback is already proven in service, under conditions of low seam heights, dips and rolls, handling rock with the coal. Two models are available with rated capacities from 2 to 5 tons per minute. Write for free illustrated folder.

* Trade Mark Reg'n. Appl'd. For

Long CHAIN CONVEYORS

LONG SUPER

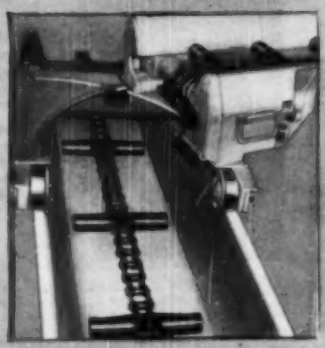
FAYETTEVILLE, WEST

DEVELOPMENT!

For the *1st time* a practical solution to the Continuous Haulage Problem

PIGGYBACK

The missing connecting link that makes continuous loading possible.



Secret of the Piggyback's success, secret of its maneuverability, flexibility and adaptability to all conditions underground lies in the two wishbone pivots and the telescopic action at the discharge end. The photograph at left shows the discharge end pivot and the wheeled dolly which gives telescopic action. At the right is the wishbone pivot at the receiving end which gives 180° pivot action at the loader

MINE CAR COMPANY

VIRGINIA Telephone 257

Switch to this new

PLASTIC Reinforced

PRIMACORD

in place of Wire Countered.

Field tested for over a year — where the going is toughest — the new PLASTIC Reinforced Primacord showed itself far superior to Wire Countered Primacord. Yet it costs no more!

Reinforced with rayon yarn, it is stronger and lighter in weight. Finished with a smooth, tough seamless plastic covering, it is waterproof and resistant to acids encountered in mineral ores. It does not become brittle or crack in cold weather, nor is it affected on hot summer days, and it is not a conductor of electricity.

PLASTIC-Reinforced Primacord is your best bet in all deep, wet holes—in preloading, pipe line river crossings, horizontal holes, marine work, coyote tunnels and sleeper shots for seismograph work.

Plastic Reinforced Primacord is recommended for "down" lines where you formerly used Wire Countered Primacord.

1. To make the most effective hookup, use a simple clove hitch in the *ground* line, as shown in these three photographs.

2. The twin loops have been folded over to form a hole.

3. Pass the Plastic Reinforced Primacord through this hole and draw the knot up *tight*.

P-1

THE ENSIGN BICKFORD COMPANY • SIMSBURY, CONN.

PRIMACORD-BICKFORD DETONATING FUSE • SAFETY FUSE SINCE 1836

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

OCTOBER, 1950

IVAN A. GIVEN, EDITOR

Challenge and Opportunity

TO COAL MEN, as to all other citizens of the United States, November will bring another wartime election. The big question is: How can it be made the last election held in such a period? Finding the answer that will yield the maximum benefits in peace and progress toward a better world order involves immediate and wholehearted concentration on at least three basic problems. No. 1 is achieving the quickest-possible victory in Korea. No. 2 is preventing the spread of war contagion. No. 3 is forging, after victory, a permanent peace.

Since, under our republican form of government, the ultimate responsibility rests with the individual citizen, and since the problems of the present and the more-distant future are far graver than any of the past, the need for full and well-thought-out participation in national and local affairs becomes even more imperative. Specifically, the job boils down to the necessary though unglamorous task of scanning policies, records and candidates with a critical eye, registering conclusions at the polls, and keeping elected and appointed representatives posted on problems and recommendations for their solution.

These points are stressed because the record of business men, managers and supervisors is not good — "appalling" is the term *Business Week* used in its Sept. 2 issue in reporting on a survey of voting activities and party affiliations in Colorado. Of the 2,314 business men responding, 859 had failed to register and so could not vote. Of the 1,455 who registered, 513, or 41%, were not affiliated with any party. Only 942 were both registered and affiliated. Though coal operators, with 49% unregistered and unaffiliated, and manufacturers, with 44%, showed up better than 13 other trade groups, they still fell far short of the record of organized labor in Denver, with nearly 80% of its members both registered for voting and affiliated.

Lack of a party affiliation means no voice in picking candidates. And without votes, candidates, no matter how desirable, cannot win. The fact is that business men are still sufficient in number to make their voting power felt if they really exercise it. In this critical period, therefore, it is imperative that coal men know the issues and candidates, and that they register and vote—and get others to do the same. Only thus can they expect results.

Voting—important as it is—is by no means the end of the responsibilities of the citizen and business man, particularly at this time. The immediate goal is a quick victory. The answer is not only manpower. It also is production of fighting equipment and the tools and materials needed to make it, deliver it and keep it supplied. Coal, as outlined in the feature starting on the following page, is "Ready to Serve." But now, more than ever before, it needs to make this fact known far and wide, and particularly in Washington. Only thus can it be sure that it will remain free from interference and that it will receive the assistance it deserves in obtaining the equipment and materials necessary for efficient production. And only by maintaining their activities in choosing their representatives and in keeping in touch with them after they are in office can coal men be further assured that every possible step is being taken to build a permanent peace. By accepting the challenge and making the most of the opportunity, they can make a real contribution to national and world welfare.

MEN AND MACHINES assure the Nation that coal again is . . .

Ready to Serve

Coal Can Speed National Defense With . . .

Modern Mines and Plants	Big Reserve Capacity
Skilled, Loyal Workers	High-Quality Product
Progressive Managers	New Financial Strength

WITH STRONG BASIC INDUSTRIES—fuel, steel, electric power and transportation, to mention only four—the United States can outproduce any other nation in the world. That's how America and the United Nations will win the drive to check Communism wherever it breaks out of bounds.

STRIP-MINES PRODUCE nearly one-fourth of the Nation's bituminous tonnage. They, like deep mines, can expand output quickly.

PREPARED COAL can take on a big share of the fuels load now carried by oil and gas and release them for specialized uses.

What Coal Asks of Washington

"Coal has the men, the mines, the machines and skills to produce . . . Coal can perform the tasks ahead if it gets what it needs to keep on working . . . Whether it gets the men and tools it will need lies with Washington . . .

"One thing coal does not need is controls . . . It is an industry that grew strong by its own efforts and can produce, efficiently and abundantly, the basic energy to tide the Nation over the troubled years ahead . . .

"All coal needs is a fair shake in maintaining manpower and obtaining essential equipment and supplies, and freedom to go ahead on its own."

The key to America's industrial might is energy—abundant energy. That means coal, oil, gas and water power. Without these, the nation couldn't fight a war through to victory.

Of all the energy sources, coal is most abundant. It adds up to some 95% of fuel reserves in the United States. It is distributed in minable quantities throughout 28 states. There's enough to last 1,000 yr and more. No other fuel can make that claim.

Coal is rugged, work-horse energy. It is not sophisticated or temperamental. In fact, oil and gas can do a better job than coal in some specialized industries. But coal makes steel for tanks, trucks, ships and guns. Burned under boilers, it makes electric power to refine copper and aluminum, drive spindles and looms, process foods and run big presses, dies and cutting machines.

Coal Can Do the Job

In this new national emergency, coal can do again what it has done already in two world wars—take on a big share of the energy load now carried by other fuels and free them for military services and the delicate industrial jobs that they alone can do. Coal can do all this and still provide homedwellers and civilian industries with all the fuel they need.

There is only one *if*. Coal can perform the tasks ahead if it gets what it needs to keep on working. Coal needs steel for maintenance and repairs; cutting machines, loaders, shovels and explosives for mining; rubber belts, mine cars, locomotives and trucks for transportation; electric cable, motors and switchgear for power; washboxes and screens for preparation plants; and men to operate machines and equipment.

Whether coal gets the men and tools it will need lies with Washington. At the start of World War II, Washington was slow to learn that coal lies at the heart of American industry. But they learned at last. They should not have to learn again. This time, the months required to re-learn an old lesson may exact a higher price.

Given tools and men, coal is ready to do its job promptly and efficiently. Coal can make that pledge because it is strong and elastic.

"Operation Bootstrap" made coal that way. Far-sighted business men and engineers built the industry on vast underground reserves. Without government favor or subsidy and in spite of obstacles thrown up within and outside the industry, they have made coal a well-run, forward-looking business and an object lesson in the merits of the free-enterprise system. With skilled miners, progressive management and improved mines and plants, the industry has boosted its efficiency and maintained a reassuring reserve capacity.

Now, stronger than ever before and mindful of the wartime lessons so recently learned, coal looks confidently to the tasks ahead. Here are the sinews of coal's strength and the secrets of its readiness to fill the Nation's needs:

Efficiency in Production

In the years before World War II, coal outgrew its pick-and-shovel days. Since then, spurred by wartime demands, market opportunities in the years immediately following, and growing competition from other fuels in 1949 and 1950, coal has invested big money in machines, equipment and new mines.

In 1947, the bituminous and anthracite industries spent close to $175,000,000 for new equipment to replace worn-out or obsolete equipment. Expenditures in 1948 were about the same; in 1949, possibly a little less because of strikes and shortened work weeks. This figure does not include the cost of supplies and materials, nor does it count equipment for new mines and preparation plants or for modernizing existing preparation plants.

The figure does count higher-capacity loading machines, continuous miners, bigger cutters, larger-capacity mine cars, faster and larger belts, bigger locomotives and shuttle cars and newly-developed machines for drilling and timbering.

In addition to these expenditures for existing mines, bituminous operators, between 1945 and 1949, opened or placed in development 223 new deep mines of significant size with a total capacity of 170,000,000 tons per year and new strip mines with a total capacity of 65,000,000 tons. Figuring costs of developing a new mine at a conservative $6 per ton of annual capacity, total money spent in the 5-year period was close to $1,500,000,000. These mines replaced worked-out mines and exhausted capacity.

Total capacity of new deep and strip mines is 235,000,000 tons per year. That's over half as much bituminous as was produced in 1949. In other words, lots of old mines have been replaced with new, modern operations. New mines provide opportunities to use new machines and new methods that could not well be used in old mines without costly alterations or temporary shutdowns. These new mines mean

Strong in Efficiency

Machine Mining Has Grown & Miner Efficiency Increased

	1945	1946	1947	1948	1949*
Mobile loading machines in use, including continuous miners	2,970	3,227	3,594	3,999	4,200
Scrapers in use	635	639	661	679	710
Conveyors with duckbills or other self-loading heads in use (bituminous only)	1,383	1,521	1,531	1,632	1,700
Tons per man-day:					
Bituminous	5.78	6.30	6.42	6.26	6.44
Anthracite	2.79	2.84	2.78	2.81	2.85
Tons per man-hour:					
Bituminous	0.705	0.733	0.807	0.830	0.850
Anthracite	0.349	0.355	0.348	0.351	0.355

*Estimated.

Strong in Quality

Coal Has Become a Better Fuel

	Number of Bituminous Cleaning Plants	Percent Bituminous Mechanically Cleaned
1945	439	25.6%
1946	445	26.0
1947	461	27.7
1948	502	30.2
1949	602	31.5

higher efficiency in a big part of the industry's capacity.

Today, because of big investments and new capacity, tons per man per day in bituminous stands at over 6.44 against 5.78 in 1945—a gain of 11.4%; tons per man per hour, about 0.875 against 0.705—a gain of 24.1%.

Reserve Capacity

If called upon, bituminous and anthracite could reach a combined production rate of 700,000,000 tons per year within a short time. That would be an increase of nearly 50% over 1949 output.

That's because there is—and always must be—reserve capacity in coal to respond to seasonal needs, keep home-dwellers warm when winters are unusually cold, and keep manufacturers going when demand for their products reaches a peak. Thus, though idle capacity can be a curse for the coal industry in slack years, it is dependable insurance for householders and industries in peacetime and for the Nation's security in times of crisis.

There'll be no trouble about getting more coal as defense needs mount. The recent slack in the industry, with some mines idle two or three days a week and miners working about 38 hr per week, can be tightened up as fast as need be. On a six-day week with all mines working, production would boom along at 700,000,000 tons.

Loyal, Well-Trained Workers

Modern coal mining is a skilled-worker industry. Underground work, stripping and preparation all require expert machine operators, mechanics, electricians and practical and graduate engineers.

The coal industry now has more of the kind of men it needs—though it still could use others. They have learned their skills through company- and industry-sponsored training on the job and in vocational schools and colleges. They will stay in the industry, draft boards willing, because wages are high, working and living conditions are pleasant and opportunities for advancement are good.

Miner loyalty to company and industry is strong. Coal companies have supplemented training for skilled jobs with information on the position of the industry, the standing of the company, and coal's achievements and needs. Magazines and newspapers, radio programs, personal letters, bulletin boards and posters, picnics and safety meets, and working-place and street-corner conversation have been helpful tools in keeping miners posted.

The results have been good, on the whole. Miners, now in possession of the facts, generally believe that their company is a good outfit and that the industry at large is well-disposed toward the people who keep it going.

On coal's weakest labor-relations front—contract negotiations—there now is a fair chance for fewer upheavals. The miners have good reason to be content with their winnings last March—more money for their welfare fund and a wage lift that kept them on top of the heap in American industry. The operators, finding a new bargaining lever in unity, also won some concessions. Both sides joined in a 28-months peace pledge. Since then, a substantial group of northern operators has set up an organization, somewhat like the Southern Coal Producers' Association, with the hope of establishing friendly year-round relations with the union and building better feelings between mineworkers and their employers.

In short, the Nation and the coal industry can count on the mineworkers. They'll produce the coal that's needed because they know what their stake is in their company, their industry and their country.

A High-Quality, Flexible Product

Coal now is a better fuel and serves a wider range of uses. To "bootstrap" itself into this position, the industry spent close to $100,000,000 to build new preparation plants and improve existing plants in 1948 and 1949. The result is 131 new cleaning plants built or placed in construction in those two years and a significant increase in the percentage of clean coal sent to market.

While installing new preparation plants, the industry launched into new methods of cleaning coal. These new processes, designed mostly for fine sizes, include heavy-media separation, coal-washing tables, hydraulic classification, froth flotation, thermal drying, and centrifugal thickening, filtering and drying.

With new cleaning methods, cleaning plants now salvage a lot of coal that formerly was wasted. Likewise, coal has been made an adaptable fuel, that, while doing work-horse service in heavy industry and yeoman service in homes and commercial buildings, also performs well in some specialized uses

Strong in Finance

What Coal Companies Did With Their Profits

	Earnings per Share		Dividends Paid		Funds Available from Net Income, Depreciation and Depletion, 1949	Invested in Property, Machines, Etc., 1949
	1948	1949	1948	1949		
Island Creek Coal Co.	$5.37	$3.36	$2.85	$3.00	$9,271,691	$1,944,375
Lehigh Coal & Navigation Co.	1.81	1.17	1.00	0.50	28,028,000*	23,472,000*
Peabody Coal Co.	2.55	3.52	0.50	0.80	4,482,474	4,321,271
Pittsburgh Consolidation Coal Co.	9.87	6.32	2.25	3.00	13,680,587	17,500,000
Truax-Traer Coal Co.	4.06	4.55	0.90	1.50	3,338,821	3,032,913

*For 10 yr ending Dec. 31, 1949.

hitherto reserved for more sophisticated fuels. That means that coal now can free a lot of oil and gas for critical defense needs.

Improvements in coal quality have been accompanied by advances in coal-burning equipment. Though coal must thank its big customers —power plants, steel, railroads and others—for a big share of progress in fuel efficiency, the industry itself has sped the advance in recent years. Through individual-company, industry-wide and institutional research, coal now is burned at high efficiency in better equipment in homes, plants and factories; smoke and fly-ash are controllable; and ash-handling is only a minor chore.

One figure tells the story of improvement in quality and burning efficiency: If coal had been burned in 1949 at 1920 efficiencies, customers would have needed 750,000,000 tons instead of the 510,000,000 tons they actually burned.

A Sound Financial Structure

Coal mining never has been a high-profit industry. In fact, since 1928 coal has had more loss years than profit years and often has had to feed on depreciation and depletion to keep going.

Even so, from their lean years coal men learned to shepherd their profits carefully, pay conservative dividends and reinvest as much as possible in their business. They used this money to buy new properties, plants and machines and to set up working-capital reserves to guarantee continued progress if hard times came again.

On the whole, dividends have been on the small side and capital investments have taken the big bite out of net earnings. For example, Lehigh Coal & Navigation Co. reported at the end of 1949 that in the 10 yr ending then, the company had spent a total of $23,472,000 for plant, equipment and a new stripping property against total profits of $28,028,000, meanwhile adding $5,732,000 to working capital.

In addition to improving properties and building up working capital out of profits, some companies have boosted their capital strength, as well as increased their capacity to produce, by mergers or acquisitions. The organization of Pittsburgh Consolidation Coal Co. in 1945 was one of the big steps in this direction. Others, to mention only a few, include The Pittston Co., Truax-Traer Coal Co., Old Ben Coal Corp., Walter Bledsoe & Co. and Northwestern Improvement Co.

Counting these and 24 other companies, there now are 30 coal-operating organizations, each producing 500,000 tons or more per year, that increased their output for 1949 over 1941, though national production was 13% less in 1949 than in 1941 and days worked were 180 against 216. Total tonnage of these 30 companies in 1949 was 81,000,000 against 47,900,000 in 1941.

Add to these 30 companies another 10 that, since 1941, have started from scratch or have moved up into the over-500,000-ton class. These 40 companies, all of which have grown and prospered, are the best evidence of imagination, vigor and hard business sense in coal. The same men who sparked this growth and now enjoy its benefits will be frontline defenders of the free-enterprise system that helped them grow and prosper.

War-Wise Management

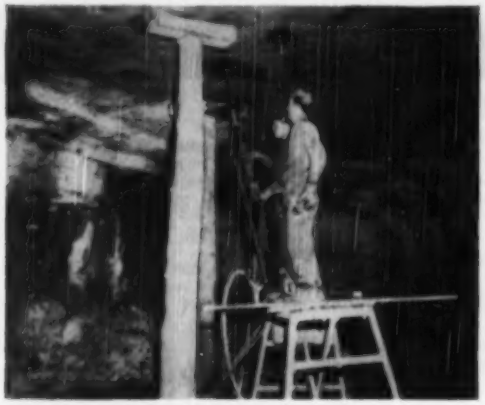
How to produce coal with fewer men, how to get along when equipment and supplies are hard to come by, and how to find their way around in Washington's winding corridors—these are some of the lessons coal men learned in World War II. The lessons, still fresh in mind, will be useful in the days ahead.

Likewise, as stated earlier, the lesson that coal must carry the major fuel load of a big arms program still is—or should be—fresh in the minds of lawmakers and bureau chiefs. With outsiders and insiders understanding coal's contribution and its needs, there's a fair chance of fair treatment in Washington.

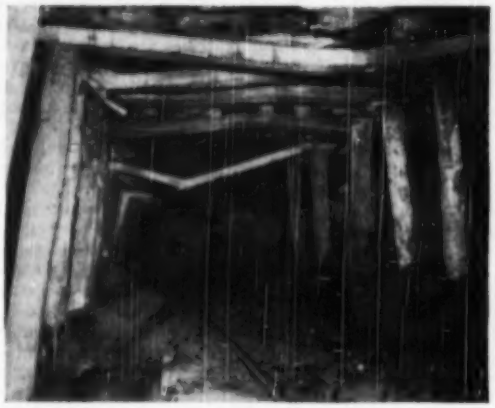
One thing coal does not need is controls. Yet some "planners" in Washington will seize on the Nation's defense program as an excuse to control production, distribution and prices of coal. Pinning coal down with controls, however, would play straight into the hands of the Kremlin. The Russians would like nothing better than to see American capitalism uprooted, free enterprise stifled and competition fettered. A fateful step in this direction would be to put coal in a straitjacket—an industry that grew strong by its own efforts and can produce, efficiently and abundantly, the basic energy to tide the Nation over the troubled years ahead.

Coal has the men, the mines, the machines and the skills to produce. All it needs is a fair shake in maintaining manpower and obtaining essential equipment and supplies, and freedom to go ahead on its own. Given a fair break, it can meet any demands the future may make.

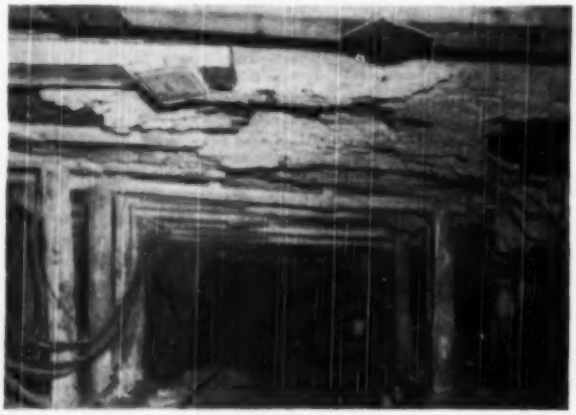
How Bolting Helps Solve Major Operating Problems at Sunnyside

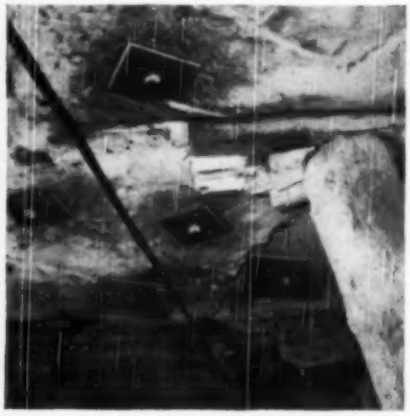


TOOLS AND METHODS—STOPER and dolly (left photo), and impact wrench (right photo) set and tighten wedge-type bolts. Two men average 25 bolt installations per shift, with place-preparation and materials-handling part of their duties. This crew is bolting roof in an enlarged airway.



ENTRY SUPPORT—MAIN ENTRY (left) and back entry (right), open longer when bolted, accommodate 10-car trip back of loading head in the main entry and permit shuttle-car travel from last room in back entry.





HAULAGE CLEARANCE—OVERLAPPED PLANKS (left), bolted to soft roof in wide entry, provide good support with maximum clearance. Right photo shows bolts holding broken roof after low timbers are cut out.

- If Timbering Costs Worry You—
- If You Lose Pillars and Stumps Under Falls—
- If You Need Increased Area in Main Airways—
- If You Wonder What Miner Reaction to Roof Bolting Will Be—
- **Here Are Some of the Answers as Found in . . .**

Roof-Bolting at Sunnyside

By JOHN PEPERAKIS, Assistant Manager, Sunnyside Mines, Kaiser Steel Corp.

These Conditions . . .

THE ONLY MINEABLE BEDS in the Sunnyside district are the Upper and Lower Sunnyside seams separated by a shale split ranging in thickness from 2 ft at the south end of our property to 26 ft at the north end. Except for a few small areas this shale is weak, and since all our present operations at Sunnyside No. 2 mine are in the clean 10-ft-thick lower seam we must contend with some of the worst roof in Utah.

The main opening is a slope down the full 9% dip of the seam. Entries on 250-ft centers are driven off this slope along the strike and rooms are driven up the pitch between entries. Joy loading units mine room and pillar coal and shuttle cars transfer it to mine cars in the entries where locomotives take it to the slope for rope haulage to the surface.

The volume of rock produced and the quantity of timber used are good indicators of top conditions in a mine. Our 1949 rock-handling and timber requirements at Sunnyside add up as follows:

Clean coal produced, tons	513,421
Mine refuse dumped, tons	55,600
Washing-plant refuse, tons	59,900
Total refuse, tons	115,500
Refuse to clean coal, %	22.5
Timber consumed, lin ft	952,093
Timber to clean coal, ft per ton	1.85

Led to This Approach . . .

MANAGEMENT IS RECEPTIVE to any new ideas that promise improved roof control. Therefore, in June, 1949, it was decided to experiment with roof bolting on a small scale. The area chosen for the test was a four-way intersection in a development entry in the northeast section of the mine where the weak-shale interval is 8 to 10 ft thick. Water seeping through the shale aggravated an already bad condition, notably a tendency to cave to the upper seam at every intersection in spite of the fact that crossbars were set on 1½- to 2-ft centers. When a cave did occur, and this frequently happened, we were confronted with an expensive clean-up and retimbering job in addition to having a non-productive section until the use of the intersection could be re-established.

We felt that if roof bolting held the rock in this section it could hold it anywhere in the mine. The 6-ft-long bolts were installed about 4 ft apart in both directions and timber crossbars were added. A few days after bolting was completed some of the plates were badly distorted, indicating that they had taken weight. This is as far as the rock settled and the intersection still stands, although nearby non-bolted but closely-timbered intersections have collapsed.

To Secure These Results

THE ENCOURAGING RESULTS obtained in the experiments formed the basis for an expanded roof-bolting program which, at present, covers all the worst-roof sections in the mine. So far, 4,000 ft of entry, 750 ft of cross-cuts and 1,300 ft of room work has been bolted. While this footage may not be impressive, it must be remembered that the work is experimental, with different tools, bolts and methods being tried.

The present rate of bolting is 1,500 ft of advance per month and this rate is expected to increase upon delivery of three rubber-tire-mounted bolting machines now on order.

At our present rate of bolting, timber savings begin to show up as follows:

	Timber Used, Lin ft per Ton
First half, 1949 (pre-bolting)	2.05
Second half, 1949 (limited bolting)	1.64
First 5 mo. 1950 (increased bolting)	1.27
Savings in Timber	0.78

Based on present production at Sunnyside this means a saving of approximately 550,000 lin ft of timber per year. While this is a substantial saving we expect to make further gains as more mobile bolting equipment is put in service.

Bolting Controls Caves

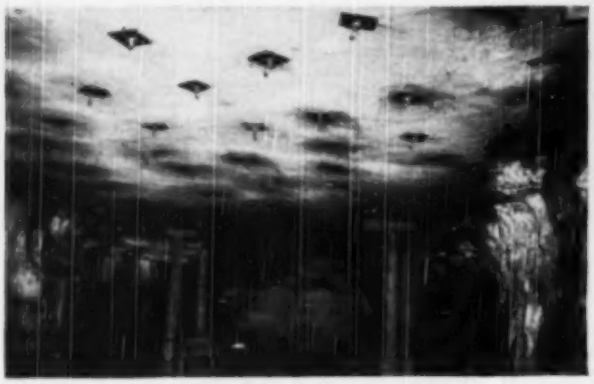
THE ABILITY OF BOLTS to hold bad top has been demonstrated many times at this mine. Three such instances, which I believe are outstanding, happened as follows:

In 5 Left pillar section, an intersection in the back entry between a room neck and crosscut which served as a shuttle-car loading head had been bolted. Shortly after the bolts were installed the non-bolted portion of the back entry, inby the intersection, began to work and in a short time caved for a distance of approximately 200 ft. The cave started at the pillar line and extended to the first row of bolts, where it stopped. The break was clean, partially exposing the first row of bolts.

The intersection roof worked for a time, with the plates showing

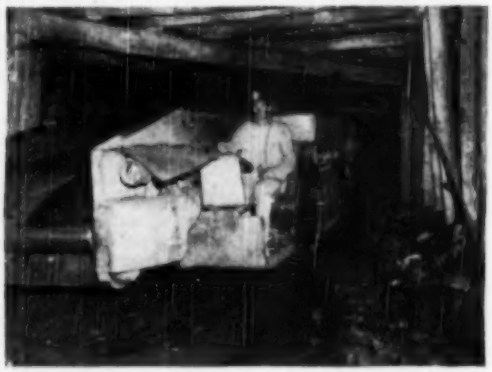
Adapted from a paper presented at the 46th Annual Meeting, Rocky Mountain Coal Mining Institute.

Improved Production and Services Result From Good Bolting Practice



MORE AIR—AIRWAY AREA is more than doubled after top rock is taken down, ribs trimmed and roof bolted. Mark Jeffs, bolting-crew boss, shows wedge-type bolts used on the airway enlargement job.

CAVE CONTROL—ROBBED SECTION caved to row of bolts along upper edge of entry.



SAFETY—ACCIDENTS are prevented, if shuttle car knocks out leg, by bolting carrier timbers to roof at intersections.

signs of weight but holding effectively. A few weeks later a heavy bump occurred which affected about 1,800 ft of pillar line, causing the roof in the room to cave. Again the fall extended to the first row of bolts facing the room and stopped there, forming another clean break. Now, two sides of the square intersection were unsupported. The room cave was bypassed and the intersection was used as the main travelway to the loader head until pillar extraction was completed and the area abandoned. The bolts held the intersection roof in place without further movement during this period.

In a second section, several hundred feet of entry had been bolted and a number of rooms turned off. As the pillars were extracted the area caved. The cave broke off along the top edge of the entry leaving the bolted entry roof unsupported along one side. This bolted overhang held for approximately 2 mo before caving occurred.

In a particularly difficult section, five recent attempts to drive rooms through to the upper entry failed as each room caved after advancing about 120 ft, thus making it impossible to approach the upper half of the block.

In starting the sixth room it was decided to use roof bolts in conjunction with crossbars to see what effect the bolts would have in holding the top. This was our first use of bolts in room work and special effort was put forth to keep the roof bolted as close as possible to the advancing face. About 1 ft of weak shale came down with the coal as it was shot. It was impossible to catch this shale with bolts because it was broken and crushed by a squeeze ahead of the face. Bolting was complicated somewhat by the jagged and uneven roof that was exposed after this shale dropped.

No regular pattern was used, spotting of bolts being left to the two-man bolting crew, who maintained an average of 2½-ft distance between bolts. As the room advanced the bolts took weight and the plates were distorted. Small pieces of rock continually chipped off between the bolts.

The room, however, was successfully driven 250 ft to the upper entry, and a portion of the block made inaccessible by the caves in the five previous rooms was recovered by panelling out from the top end of the completed room. It is the opinion of our operating staff that without roof-bolting this room would have caved after having been driven only a short distance.

Having re-established a good caveline, we no longer find it necessary to use bolts in rooms in this section. Crossbars on 4-ft centers are doing the job. Bolting now is used in three other room-and-pillar sections with marked improvement in roof control and production.

To date, 48% of our roof bolts have been inserted at back-entry-and-crosscut intersections that serve as approaches to shuttle-car loading heads in the main entries. In retreating with pillars, trouble was encountered in keeping the back entry open for several hundred feet outby the pillar line. Crossbars set during the development of these entries had to be reinforced with additional bars until the sets were skin-to-skin. All too frequently, this was insufficient to hold the roof. Now, bolting keeps the back entries open as desired, timber requirements are cut almost in half and rock falls are practically eliminated.

The benefits derived from this practice are not only reflected in increased productive time in a section, but also carry over into the haulage system.

Helps Haulage

Reductions in the quantity of timber sent into the mine and the quantity of rock brought out of the mine decrease interruptions to hoisting that result from switching and assembling rock and timber cars at the head of the slope. Also the number of cars tied up in timber-supply and rock-disposal service is reduced.

Another important advantage is gained when roof bolts are used in the main entry to hold top in place inby the shuttle-car loading head so that a standard 10-car trip can be stored. Prior to the use of bolts it was practically impossible to hold the main entry open for the length of a 10-car trip past the loading head. It was necessary to use shorter trips, thus increasing non-productive time because of more frequent trip changes.

In entries that have been standing open for a considerable time and where the roof is badly broken, existing crossbars have been bolted to provide more bearing area. We find that bolts help hold such top provided the break does not extend too high. Last March, a 60-ft length of roof in a standing entry broke and settled on the timbers, forming a low spot in the haulageway that caused excessive spillage as the loaded trips passed under. This sagging rock was bolted to a layer of firm rock above and was actually drawn back into place as the bolts were tightened. The low crossbars were then removed to provide the necessary clearance. To date no trouble has been experienced at this spot.

Increases Airway Area

We have done a limited amount of bolting in permanent air courses, with the long-term objective the bolting of all main intakes and returns. To support the overlying shale, 2 or 3 ft of top coal was left in place when existing air courses were driven. In some spots this top coal now shows signs of breaking up. Crossbarring and center-propping the top coal would reduce the cross-sectional area and restrict the flow of air.

Now, to provide more air for expanded development, the top coal is shot down and the exposed roof bolted. The airway area is almost doubled after the top is shot and the ribs trimmed.

The section in which this work is now done is one of the few in the mine where the roof rock is strong enough to remain in place until bolting catches up. Bolting lags somewhat because the 12-ft height in the expanded openings requires that the bolting crew work from staging. Also, our present equipment makes it impossible for bolting to keep pace with enlargement, but we expect to have more mobile equipment available by the time we reach the bad-roof sections.

Promotes Safer Mining

In a mine as heavily timbered as Sunnyside, fire would spread rapidly if not detected in time. Fortunately, the few fires that have occurred were spotted shortly after outbreak and were put out by direct methods. With more extensive roof bolting and the consequent reduction in timber, this hazard will be greatly reduced.

Plank-type crossbars, 4x8-inx12-ft, have been bolted to the roof to successfully hold top coal in place. Carrier bars at intersections also are bolted to the roof to remove the danger of falling crossbar and roof if a shuttle car knocks out a timber leg.

The majority of our miners and supervisors questioned the ability of bolts to hold the top when the program was started. In fact, they thought the idea was rather silly, that the company was wasting time and money, and that in a short time the project would be abandoned. No selling job was attempted, management itself taking a wait-and-see attitude. All bolting was done in conjunction with timbering, and still is, although spacing between crossbars has been greatly increased.

It was not long, however, until management, supervisors and miners were sold on this method of roof support. Today, the attitude of the majority is aptly expressed by this recent statement of a miner, "I feel much safer under a roof bolt than under a crossbar now."

In addition to increasing safety for our personnel, roof-bolting in one instance protected our equipment investment. A few months ago a loading machine and cutting machine were working in a large open pillar area that was only partly bolted but closely timbered. The roof started to work, the men were ordered out of the place, and shortly thereafter the top came down. Several days were spent in recovery operations. Fortunately, the approaches to the pillar were closely bolted and timbered. Otherwise it might have been impossible to recover the equipment.

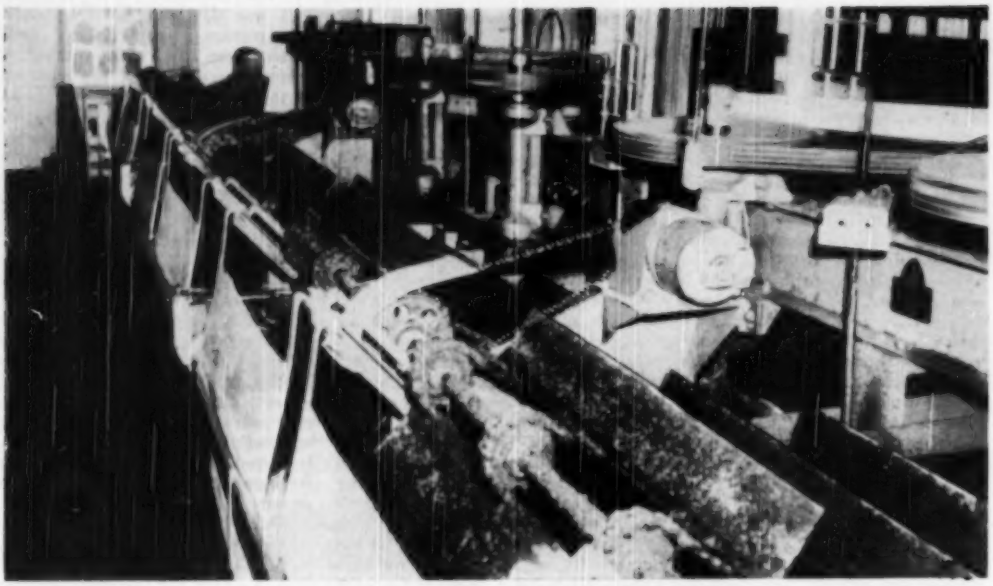
We have no record of an injury caused by a fall of rock or coal in a properly bolted opening. However, we have not been entirely free of failures. One intersection collapsed after being bolted and timbered. The 10-ft interval of fractured and water-bearing rock between the two seams came down, and it is doubted if any form of roof support would have held. Possibly longer bolts on closer centers might have sufficed.

Tools and Methods

Both wedge-type and expansion-shell-type bolts are used, with the former predominating. The wedge-type bolts are 6 ft long and 1 in in diameter; expansion-shell-type bolts also are 6 ft long, but ¾ and ⅝ in in diameter. Most-commonly-used plates are ⅜x8x8 in, but, under extremely bad roof, plate size is increased to ⅜x15x15 in. Stopers and electric coal drills make the roof holes, the electric drills working in softer rock to provide holes for expansion-shell bolts.

A two-man crew normally can drill and bolt 40 holes per shift if there is no interference. However, the average number of holes drilled and bolted is 25 because of interruptions by face machinery, and time consumed in moving equipment and doing the necessary trimming and propping to make the place safe.

Suggestions from Bureau of Mines engineers and personnel of the state inspection department have been very helpful in getting our roof-bolting program established.



SPECIAL CONDITIONS are met by special flotation machines, though most installations are standard equipment. The unit shown here —a single-overflow machine—employs deep-digging froth-removal rakes.

Increasing Coal Recovery by . . .

Flotation for Fines

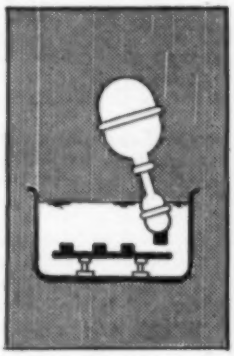
What Coal Flotation Is — How Coal Flotation Works

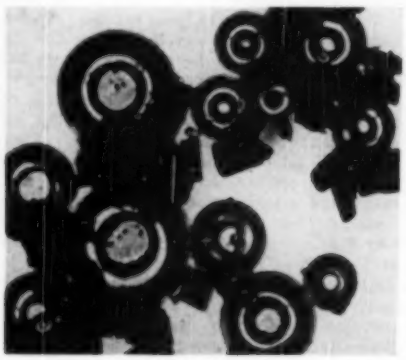
Cost and Quality Factors — Predicting Flotation Results

By JAMES A. MACPHAIL
Field Engineer, Denver Equipment Co.

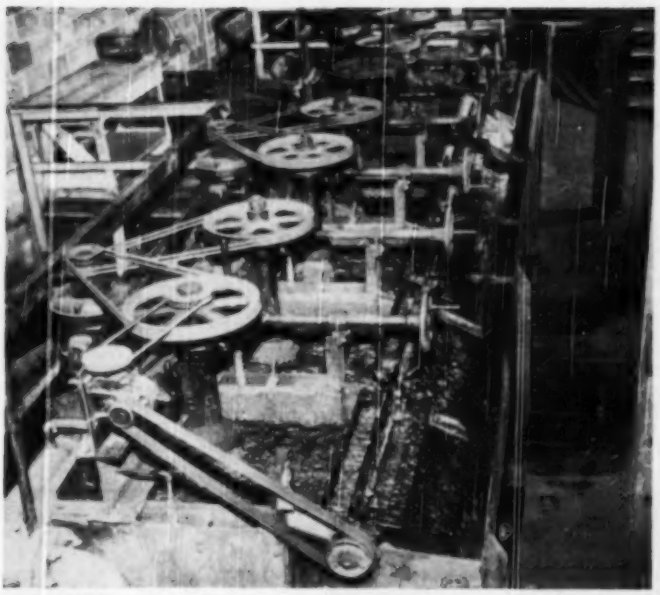
FLOTATION, as applied to recovery of marketable coal from wastes, is relatively new in the United States. It makes available to engineers and other executives in the industry a profitable new tool. Because it is new, however, it is not yet widely understood. Neverthe-

CAPITALIZING ON EXPERIENCE in every major eastern and southern coal field, James A. MacPhail has specialized in every phase of applying flotation to fine-coal cleaning since joining Denver Equipment.





THE DISCOVERY that bubbles would selectively pick up and carry chemically coated particles to the surface was the beginning of the flotation process. Enlarged photo at right, by H. Rush Spedden, shows bubbles carrying load to surface.



SPECIAL SCREW CONVEYOR is installed on these coal-flotation machines to reduce moisture content of the coal for immediate shipment.

less, the potential in increased efficiency and profits from recovery of waste coal fines makes flotation important to every coal-preparation engineer.

Flotation is a process that makes use of bubbles to float specific materials to the surface of a liquid pulp. Flotation was developed early in the century for the mining industry when it was discovered that a bubble would selectively pick up and carry to the surface a chemically coated particle of mineral. As many as seven different minerals in one complex ore have been recovered individually by flotation. Today, more mineral is recovered by flotation than by any other single process. Since its discovery, flotation has spread to many industries as a separatory process.

● **Cost and Quality**—Full-scale profitable plant operations prove that coal fines (¼ in by 0) can be recovered and cleaned by flotation at a cost of 20 to 50c per ton of cleaned coal. These costs include all labor, operating power, flotation reagents and maintenance. Ash content in coal recovered and cleaned by flotation varies somewhat in accordance with the inherent ash of the raw coal, but ash has been reduced from as high as 50 to 60% down to 5% by use of the flotation process.

How Flotation Works

Fundamentally, coal flotation is a simple operation. Coal fines are first pulped with water and then "conditioned"—coated with kerosene or some similar reagent. A froth-producing, or "collecting," reagent—usually pine oil—is added and the pulp is subjected to controlled agitation and sub-aeration. Agitation and sub-aeration create bubbles which attract and collect the fine particles of coal and carry them to the surface, where the fines are removed, dewatered and marketed or stored.

The reason why flotation bubbles attract coal and not the high-ash gangue is because the kerosene reagent selectively places a film of oil on the coal particles. Because of the difference in surface characteristics, ash or gangue is not filmed. This produces a difference in wettability between the surfaces of the coal and the gangue material. The surfaces of the coal particles become more water-repellent.

Then, with the creation of bubbles, a chemical attraction, or affinity, is established between the reagent-coated coal and the bubbles. Coal fines join the bubbles and "float" to the surface. Gangue material is not attracted to the pine-oil bubbles and does not float.

● **Reagent Quantities**—Quantities and types of reagents differ according to the composition and character of material being floated. Generally speaking, however, about 2½ to 3½ lb of kerosene or fuel oil and from 1/5 to 1/3 lb of pine oil are required per ton of feed.

The Flotation Machine

The flotation action takes place in a machine consisting of:

1. A tank to hold the coal fines, water and reagents.
2. A means of agitating and creating bubbles.
3. A method of removing the coal froth.
4. A means of disposing of the waste or tailings.

A flotation machipe is composed of several "cells" in series. The size and number of cells in a single machine depends upon the production desired.

● **Flotation Aeration**—Flotation engineers have discovered that one of the most important factors in flotation is "aeration" and correct bubble structure. For example, controlled large volumes of small bubbles are most effective because they present a large surface area, or "attracting surface," to which the coal fines will adhere. In addition, small bubbles are more active, more selective and more efficient than larger bubbles.

To illustrate how the attracting surface increases with smaller-size bubbles, compare a bubble to a 1-in cube. Such a cube has six sides, with a total surface area of 6 sq in. When the cube is divided into 1,000 1/10-in cubes, the exposed surface area is increased from 6 to 60 sq in.

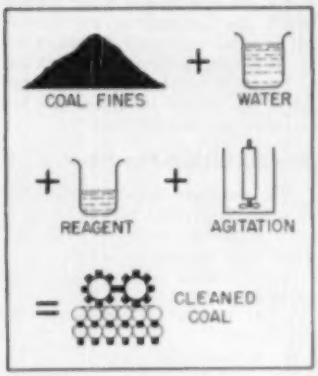
A 1-in cube of coal, when crushed or broken to pass through a 10-mesh screen, would experience a similar increase in surface area. Positive control of aeration therefore is an important factor in efficient flotation results.

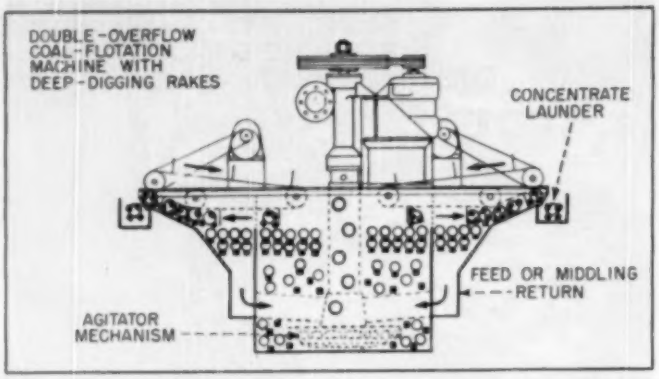
Recent developments in small-scale laboratory testing have resulted in rapid, accurate and economical answers to questions as:

1. Can waste fines be recovered and cleaned by flotation?
2. What percentage of ash material can be removed by flotation?
3. What will the ash content of the coal fines be after cleaning by flotation?
4. What size of plant and what equipment will be required to recover and clean the coal fines?
5. What will the cost of the entire installation be?

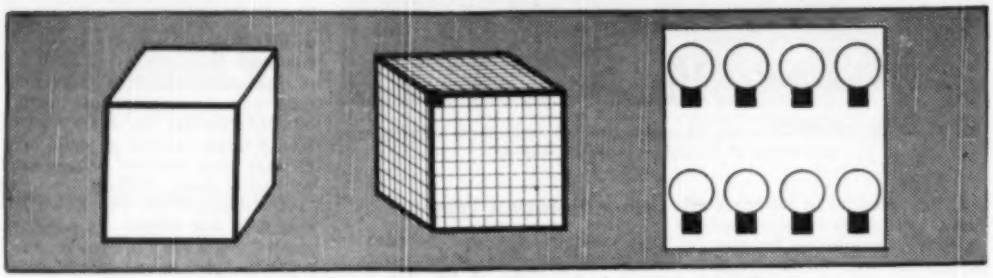
Ordinarily, a 100-lb sample of coal is sufficient for extensive batch

Laboratory Testing Leads to Better Flotation Results

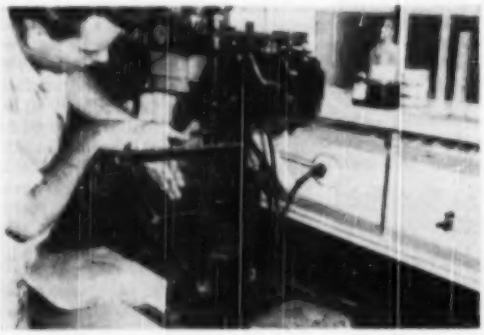


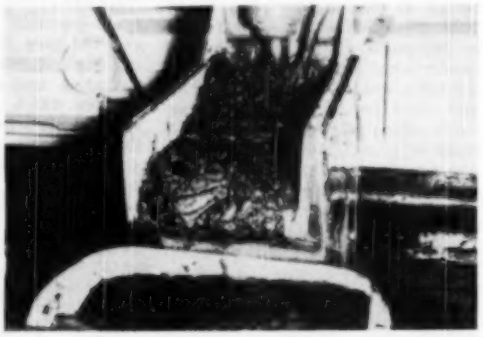


COAL FINES PULPED WITH WATER are "conditioned" in an agitator (left) where fuel oil and pine oil are added. Coal fines adhere to bubbles and float to surface in coal-flotation machine (right) consisting of tank, mechanism for agitating and creating sub-aeration, a method of removing fines that float and a method of disposing of tailings or waste.



CUBE COMPARISON shows why bubble structure is important. Greater surface area provides greater attraction. Coal ⅛x0 responds to flotation best.



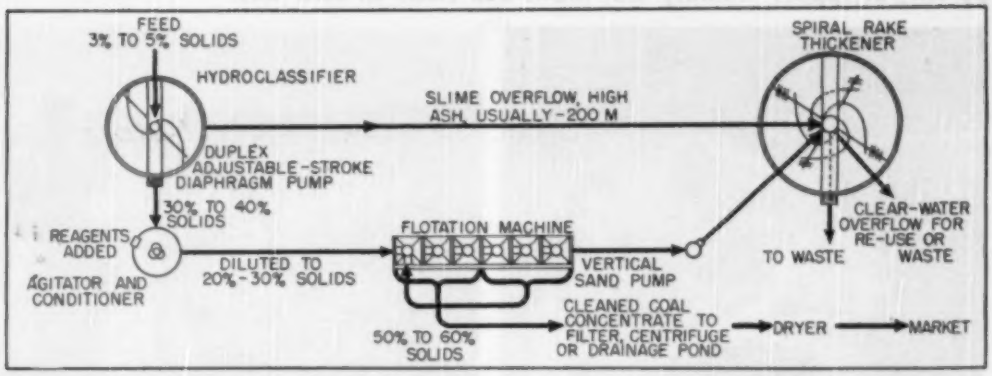


LABORATORY TEST of coal sample supplies important data necessary for projected planning and operation. The machine shown in use is a 1,000-gram laboratory unit with glass sides for observing the flotation action.

tests. Continuous, or pilot-plant, testing requires considerably more material—usually 5 to 10 tons—for accurate results.

• **Test Results**—Laboratory testing of coal fines has predicted profitable flotation results all over the world. Examples include a sample of anthracite washery sludge from Pennsylvania. The raw feed assayed 47% ash and was all minus ¼ in. Laboratory tests indicated that flotation would recover over one-third of the feed and produce a clean product with an ash content of 16% or less.

Even high-ash mine-run coal can be beneficiated by flotation. In South America, a deposit was unable to produce a marketable product because of the close association and wide distribution of high-ash material. Mine-run coal assayed 22% ash and normal cleaning methods failed to produce a marketable product. Laboratory tests, however, showed that crushing to minus 28 mesh released coal from the high-ash gangue. Flotation recovered 75% of the feed and produced a clean-coal concentrate with only 11% ash.



SIMPLIFIED COAL-FLOTATION FLOWSHEET with six-cell flotation machine in circuit. While flotation results naturally will vary with the coal being treated, full-scale plant operations have proved that 1/8x0-in fines can be recovered and cleaned by flotation at a cost of 20c to 50c per ton of cleaned coal. Ash content has been reduced from as high as 50% to 60% down to 5% by flotation.

● **Limiting Factors**—Not all coal fines present commercial-recovery possibilities. This is because two factors must be brought into balance. One is the quantity of coal recoverable by flotation, and the other is the percentage of ash remaining in the clean coal.

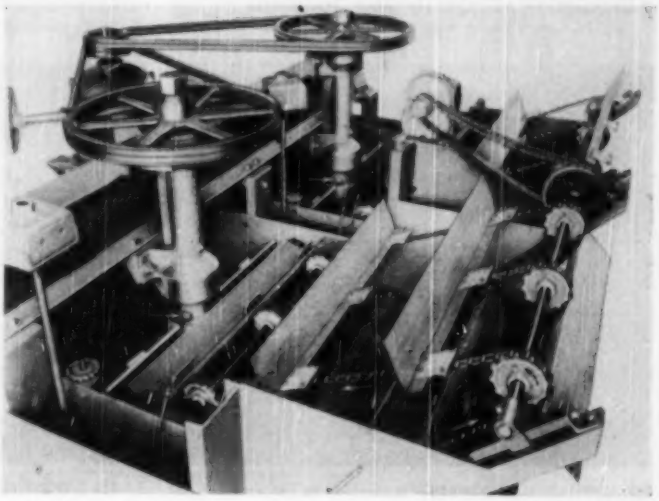
It frequently is possible to produce a cleaned product with an extremely low ash percentage only to discover that the quantity of coal recoverable is too low to permit economical processing.

When the quantity of coal recovered reaches an acceptable percentage, it may be found that the ash content also increases because of the close association between the ash and the coal. This may increase the ash content of the flotation concentrate to a point higher than the market will accept. Often, some grinding to release high-grade coal from ash material will remedy this situation.

The objective, of course, is to recover as much of the feed as possible and keep the ash content of the clean coal as low as possible. However, when an out-of-balance ratio is present, it can be discovered by laboratory testing. This was the case with a sample tested by the Testing Div. of the Denver Equipment Co., where the closest balance was 40% recovery by weight yielding a coal concentrate with an ash content of 13%. Under the specific operating conditions, this recovery and ash content was unsatisfactory.

A sample of 28%-ash washery fines from Canada yielded a flotation product assaying 10% ash but representing only 30% of the feed. These washery fines were all minus 10 mesh. Grinding the coal to minus 28 mesh and retreating the middlings increased the recovery to about 65% with an ash content of 10%. Grinding to finer than 28 mesh did not materially improve the results.

The real value of laboratory testing lies in the fact that accurate tests can indicate whether or not there is a worthwhile profit to be gained through flotation.



SPECIAL FROTH-REMOVAL rakes are used on this type of flotation machine. Size of the cell or tank is 56x56 in.

● **Auxiliary Equipment**—A flotation installation requires, in addition to the flotation machine, an agitator to "condition" the raw coal or feed with reagents. Reagent feeders, which accurately control the amount of reagents added to the feed, are required, as well as hydroclassifiers, thickeners, pumps and filters. In some instances, additional screens or crushers may be necessary.

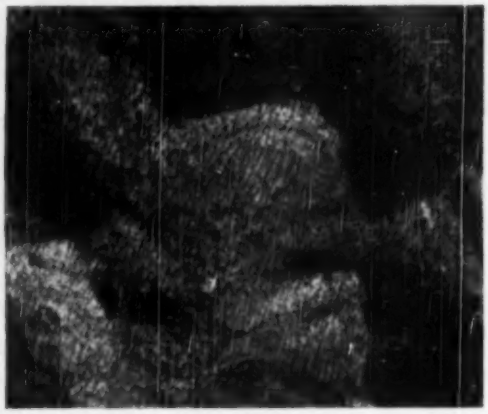
● **World-Wide Use**—Because of the readily available low-cost supply of coal, little attention, until recently, has been directed to the recovery of marketable coal from wastes in the United States. Now, however, with increased production costs and competitive fuels exerting heavier pressure, flotation has claimed an important position as a profit-builder. The principle of flotation with sub-aeration has been used for many years to profitably recover every particle of marketable coal from mines in England as well as most countries throughout Continental Europe.

By Air, Strippers Quickly Get Multi-Use Facts at Low Cost

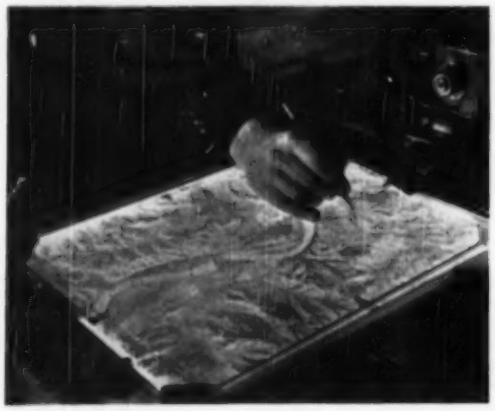
MAPPING PLANE maps over any terrain at better than 100 mph. Pilot-photographer team plans work before take-off.

FIELD-SURVEY PARTIES establish ground control for air survey. Radio transceivers facilitate communication between crews.

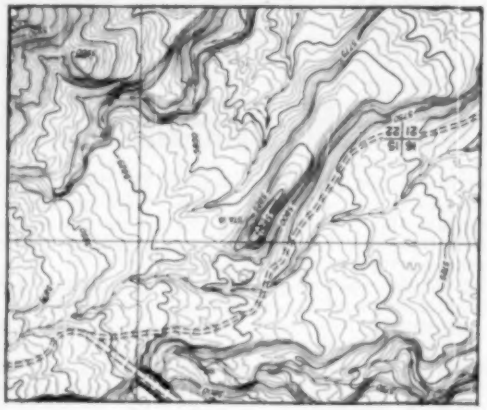
LOW-COST RECONNAISSANCE is provided by photo-map at cost of a few cents an acre; good for everything but contours.



TIMBER INVENTORIES can be made with aerial photos. Viewed stereoscopically, type and sizes can be determined.



PRECISE STEREOPLOTTING INSTRUMENTS are used in compiling contour maps. Contours are drawn on transparent overlay.



RICH IN DETAIL and reliable in topographic data, the aerial contour map is sound base for all types of planning.

BENCHING AND OUTCROP are recorded by the mapping camera. In ground reconnaissance, brush may obscure surface geology.

SPOIL AREAS AND RECLAMATION can be planned with the aid of aerial photography, which provides necessary overall view.

Promoting Stripping Efficiency by . . .

Aerial Mapping

Fast, Low-Cost Air Surveys Provide Facts for . . .

- Estimating Coal Acreage
- Delineating Crop Lines
- Plotting Boreholes
- Computing Overburden
- Inventorying Timber
- Locating Spoil Dumps
- Plotting Property Lines
- Planning Redevelopment
- Planning Rail Spurs
- Aiding Geologic Study

ACTIVE IN AERIAL MAPPING since 1941, George L. Hess brings early engineering experience in Pennsylvania coal mining and a broad knowledge of photogrammetry to the application of aerial surveys to the mapping needs of the strip industry.

By GEORGE L. HESS
Aero Service Corp.
Philadelphia, Pa.

PHOTO RECONNAISSANCE at a few cents an acre—topographic maps at half the cost of ground surveys—these are the air-survey economies that put up-to-date mapping coverage within the strip-mining budget. These savings, however, are only part of the reason why more stripping engineers are planning for aerial mapping of their properties. The multiple uses for aerial maps and photos is the big factor.

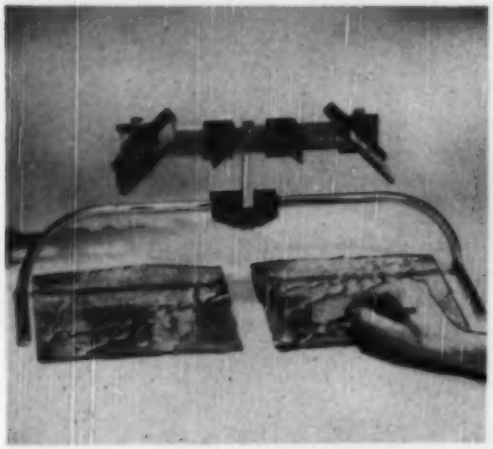
In the past few years the strip-mining engineer has become better acquainted with aerial mapping. He has learned of its accuracy, its detail, its speed. He has found new uses for this new tool in increasing the efficiency of his operation.

Unlike ground surveys, aerial mapping is flexible. The same set of aerial negatives will do three jobs. First, you get aerial photos for stereoscopic study. They can be assembled into a photo-mosaic—a good reconnaissance map. Then, with the areas of interest defined, a contour map can be compiled from this same aerial photographic base. Each of these products of the aerial survey can be used in money-saving ways.

What Air Surveys Will Deliver

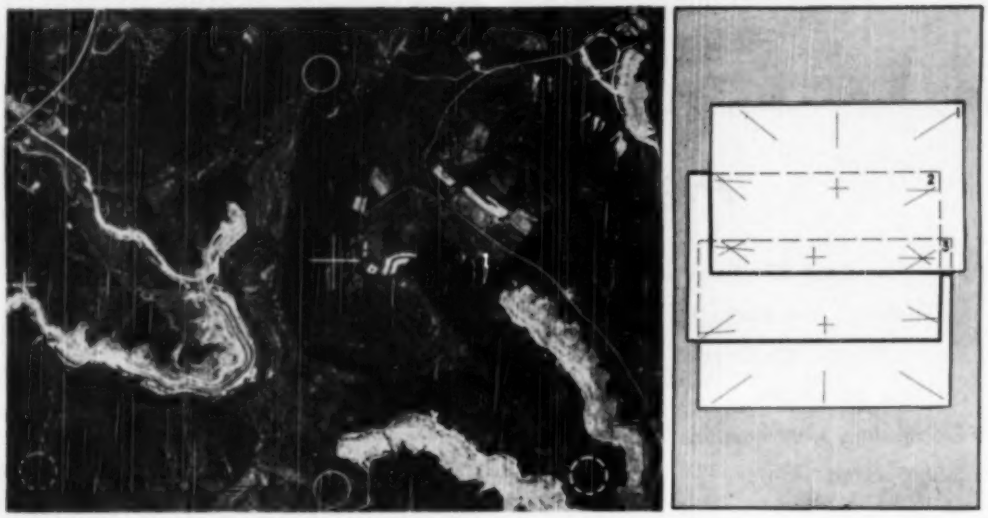
First of all, the aerial mapper delivers individual aerial photographs to the mining engineer. These are taken with an overlap of 50 to 60%, so that pairs of photos may be studied stereoscopically. Seen in this third-dimensional view the relief is great, and details that

Precision Methods and Careful Control Insure Air Survey Accuracy



WITH STEREOSCOPE, aerial photographs are seen in third dimension, facilitating concentration on particular areas.

ASSEMBLING PHOTO-MAP. Each photo is corrected for tilt and scale difference and carefully placed in correct position.



NINE CONTROL POINTS for each aerial photo are established by field-survey crews to assure accuracy in compilation. Position of control points (right) is such that each photo has three points in common with preceding and following photos.

often go unseen on the ground may be observed.

For example, the geology of an area can be studied. Such geologic features as benching and outcrop may be traced, though in observation on the ground they are often obscured by brush. This stereoviewing will never take the place of first-hand observation and study of surface geology, but it does supplement it importantly. It helps to direct ground studies to areas of primary interest. During the weeks when weather makes ground studies virtually impossible, stereo pairs of aerial photographs are useful in scanning the area and making plans for later field work.

Timber for mine use is a problem always with the engineer, and here the aerial pictures can help in an evaluation of timber resources. With the stereoscope the engineer can identify timber types and estimate size.

Assembled as a precise photomosaic (photo-map) these aerial photographs provide a broad overall view of the entire property. Why undertake ground reconnaissance, says the progressive engineer, when you can buy an aerial photographic record of the whole property for less per acre than the cost of driving over it?

Although not quite as accurate as the topographic map, the photomap records a wealth of cultural detail in true relative scale. It can be the base for planning redevelopment—for forestation or reclamation of mined-out areas. In those states requiring that a bond be posted and a map submitted before an area is worked, the photomosaic satisfies the map requirements at minimum cost.

Deriving Topographic Maps

With the photo-map at hand, the areas of interest can be defined for detailed topographic mapping. The topographic map is the most exact product of aerial mapping. It is compiled in *one-half to one-fifth the time needed for ground surveys.* Its costs are very much less than with plane-table methods, and its accuracy equals or exceeds maps prepared by ground methods.

Aerial photography captures a great deal of the cultural information not ordinarily shown on maps because of the prohibitive costs of securing such detail. However, this detail is easily traced from the photographs and shown on aerial topographic maps.

With an aerial topographic map the mining engineer can:

1. Estimate coal acreage.
2. Delineate crop lines.
3. Plot boreholes.
4. Locate spoil dumps.
5. Lay out access roads.
6. Plan rail spurs.
7. Compute overburden.
8. Plot workings for tax purposes.
9. Plot property lines.

The map's usefulness develops and grows within the mining company. A number of companies have found that after the maps are at hand scarcely a week passes that an office solution is not found for problems which before could be solved only by sending men into the field. The saving in time, plus the saving in the cost of the field parties, is substantial. The needed map facts are there—detailed, accurate, up-to-date and readily at hand for management decisions. They speed the solution of many an operating problem, from rapid quantative estimates of acreage and overburden to broad redevelopment planning.

Air-Survey Costs

The price tag for the air survey varies according to the size and shape of the area, scale of the maps, amount of existing control and the contour interval. But for areas of 1,000 acres or larger, the air method always costs much less than ground surveys. For instance, aerial mapping of a 7,210-acre property in southern Illinois was accomplished at $1.84 per acre, whereas ground surveys for a nearby 2,045-acre tract with similar terrain cost $2.92 per acre. Both were mapped at a scale of 1 in equals 100 ft, and the contour interval was 5 ft.

In general, maps at a 5-ft contour interval cost upward of $1.50 per acre; 10-ft interval, 60c per acre or more; 20-ft interval, 35 to 50c per acre. Of course, the cost of each mapping must be estimated separately.

Photo-maps or mosaics vary in cost too, according to scale and the size and shape of the area. This cost is in the 4c to 6c per acre bracket. This includes the individual aerial photos for stereo study.

Producing the Maps

The aerial photographs are the base for both the photo-mosaic and the aerial topography map. Before assembling the mosaic, the photos must be "corrected" for minor tilt which occurs because the airplane cannot be maintained in absolutely level flight. Adjustments are made too for the scale difference in photos. These occur because the mapping plane photographs peaks and valleys from the same fixed altitude so that the peaks appear at a larger scale and the valleys at a smaller scale than actually exists.

Compilation of mosaic or photo-map is not simply a routine of glueing or tacking the aerial photos to a base as you would assemble the pieces of a jigsaw puzzle. First, grids are plotted on the base or plot board over which the mosaic is assembled. Next, the coordinate positions of the control points are indicated on the board. These control points are marked on the aerial photos, and then the photos are placed in position on the board.

The photographs, however, do not match and fit together perfectly because of the tilt and difference of scale unavoidable in aerial photography. So, a comparison is made of the true distances on the plot board and the distances seen on the aerial photo to establish how much the photo must be tilted, enlarged or reduced to fit, in true horizontal position in the finished mosaic. After corrected prints have been made, they are marked with the control points and assembled on the plot board, with each photograph placed carefully in its correct position. This composite is then copied as a photo-map.

Compilation of the topographic map from an aerial photographic base is a more complex and precise process. After the tilt in the original photographs has been corrected, they are viewed in stereo-plotting devices of great precision. The stereo-plotting instrument gives a third-dimensional view of aerial photographs, and the operator drafts the successive elevations until each pair of photos has been contoured. The individual contoured sheets are then assembled and the finished map tracing is made.

In aerial topographic mapping a minimum amount of ground control is needed. Field-survey parties obtain nine vertical control points for each pair of photos, and the horizontal control is made up of several points established along each flight strip. By using the new Wild theodolite, vertical and horizontal control is run simultaneously.

With the network of ground control and the stereo pairs of photographs, contouring with the stereo-plotting instruments can be done much more rapidly than plane-tabling and interpolating field notes. Moreover, the aerial topographic map is more complete since details such as ponds, buildings, power lines and fences are recorded. In aerial mapping the practice is to overfly the area to obtain the boundary features. In addition, the maps serve as a base to plot property owners' names, drillholes, outcrop and other data.

Aerial Mapping Accuracy

"But how accurate is aerial mapping?" the stripping engineer asks. During recent years the science of aerial topographic mapping has developed so that the maps compiled by these methods meet any civil-engineering requirement. Standard specifications provide that 90% of all elevations shall be accurate within one-half contour interval, and no part of the map shall be in error more than one contour interval.

The contour interval can be 2, 5, 10, 20 or 25 ft, as required. Of course, the smaller the contour interval the more costly the map compilation. The choice of contour interval depends on the terrain and the map's future use. In Utah recently we mapped an area partly at 5-ft intervals and partly at 25-ft. A West Virginia concern, on the other hand, felt that 20-ft contours were adequate for their purposes.

Aerial mapping has worked for the strip-mining industry in Illinois, Indiana, Kentucky, West Virginia, Oklahoma and Utah. Because it delivers fast, low-cost reconnaissance to the engineer, then follows up with reliable maps at a fraction of ground-survey costs, this modern tool is growing in use throughout the industry.

POWER CONDUCTORS, suspended from approved insulators and sectionalized for circuit-protection and fault-isolation, promote smooth operation over the wide area included in Frederick mine workings. Circuit breakers (right) prevent wear and tear on equipment.

C. F. & I. Maintains Efficiency and Safety at Frederick Mine by . . .

Modernizing Power Distribution

Sufficient Substation Capacity, Ample Feeder Capacity and Sectionalizing Provide . . .

▶ High Voltage at the Face ▶ Increased Operating Time
▶ Fewer Power Interruptions ▶ Reduced Fire Hazards

HIGH OPERATING VOLTAGE at the face through the use of sufficient copper in transmission lines with matching substation capacity and protection for the power network through the use of automatic reclosing circuit breakers are features of the extensive power distribution system at Frederick mine, Colorado Fuel & Iron Corp., Valdez, Colo., where coking coal is produced for the company's Minnequa steel plant at Pueblo.

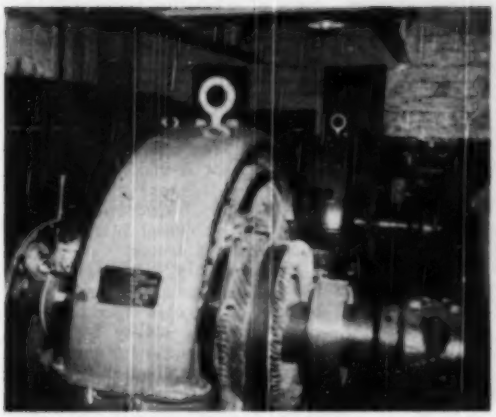
RATED OUTPUT from this battery-charging station is a result of good voltage at the point of use. Adequate copper in feeders carries rated voltage to all machines.

Opened in 1907, Frederick has developed to distances up to 6 mi from the portal. Cover rises rapidly from the portal, since the mine is in the foothills of the Rockies. Therefore, opportunities for additional openings are lacking. As a result, haulage distances are long and haulage power requirements are high. Also, mechanized mining units operate deep in the mine, adding to the possibility of high transmission losses.

However, strict engineering control over the growth of the power-distribution system provides ample power for all loads while keeping voltage drop to a minimum. Increasing substation capacity by adding modern units as the need develops, workmanlike installation of power lines with sufficient current capacity, and good housekeeping and maintenance keep the system modern and efficient.

Benefits resulting from these policies are: fewer interruptions in haulage; more efficient performance, longer life and reduced maintenance of equipment; and increased safety.

● **Power Requirements**—Production from the 40- to 60-in Frederick seam requires power-consuming equipment as follows:



MOTOR-GENERATOR SETS (left) provide dc power at 550 v for main haulage between surface and gathering points, while circuit breakers (right) prevent power-interruptions in the production sections from affecting main haulage.

1. Mining units for 21 places, each consisting of a Goodman shaker conveyor with duckbill and G-20 drive, a Goodman 512 cutting machine and a Chicago Pneumatic CP-574 drill.

2. One 18-ton and six 13-ton Jeffrey trolley-powered haulage locomotives. Battery-powered locomotives operate beyond the trolley wire and the batteries for 13 of these 4-ton units are charged by 10 m-g sets in four charging stations. Each charger requires 12 kw.

3. Thirteen pumps, each with 10-hp motor.

4. Five 75-hp compressors supplying air for hand-mining sections and roof-bolting experiments and installations.

These major units, plus small auxiliary power users, add up to a total connected load of approximately 2,900 kw on the underground distribution system.

● **Power Supply**—To handle the load at normal and peak conditions, company officials have provided, during the life of the mine, three substations with a combined capacity of 1,200 kw and have installed lines with sufficient current-carrying capacity to keep voltage loss within the prescribed limits.

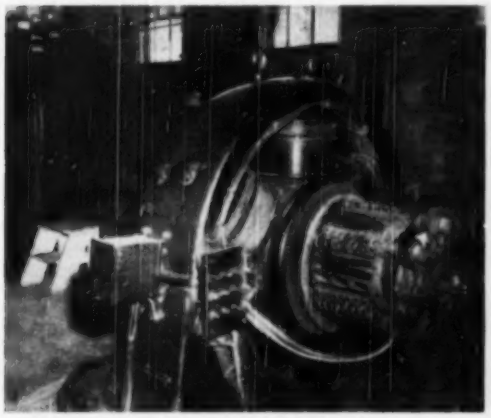
Substation No. 1, installed in 1915 and still operating effectively, has two 300-kw Allis-Chalmers m-g sets. These are in a surface station near the mine opening and supply power for the main haulage system.

Substation No. 2 is a second surface installation in Widow Woman Canyon, where cover is thinner and a power borehole could be economically drilled. A 300-kw General Electric rotary converter with automatic control and protective devices supplies dc power through the borehole cable to underground equipment.

Substation No. 3, a portable 300-kw Westinghouse mercury-arc rectifier, is underground in the active workings.

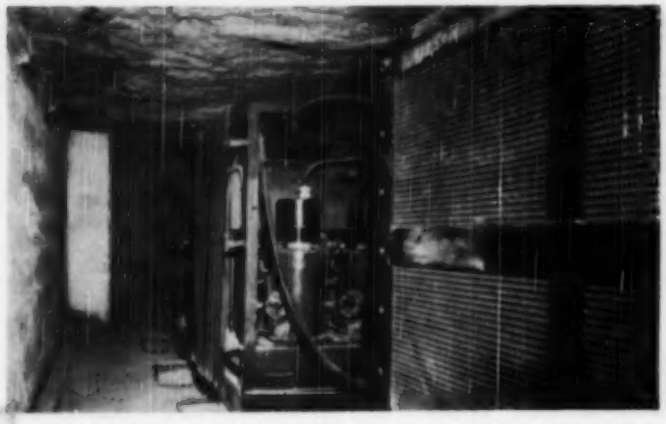
The m-g sets and rotary converter change 440 v ac to 550 v dc. Power transformers at each of these stations step down 22,000-v purchased power to 440 v. Purchased power, stepped down to 2,400 v, is carried through an airshaft in the canyon to an underground transformer at the rectifier that reduces the 2,400 v to a value that will give 550 v dc after rectification.

The combination of these three

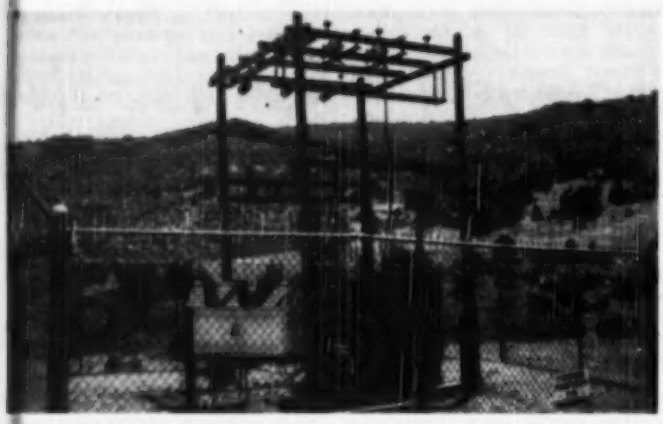


ROTARY CONVERTER in surface substation feeding dc power to underground machines through a borehole cable receives a daily maintenance check, though automatic controls and protective devices greatly reduce outages and damage possibilities.

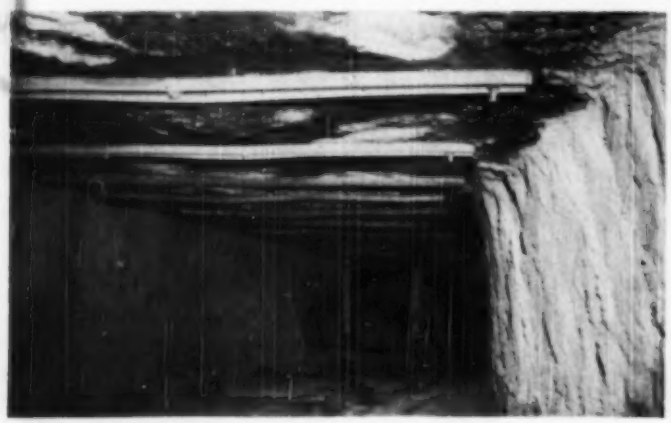
M-G Sets, Rotary Converter and Rectifier Provide DC Power



MERCURY-ARC RECTIFIER, a 300-kw portable substation, adds flexibility to the entire power system as it is moved to follow the maximum-load center in the mine. Vacuum-pumped tubes rectify ac power supplied by the transformer on the ac unit.



PURCHASED POWER, at 22,000 v, is stepped down to 2,400 v in these surface transformers to serve the 3-phase power transformer in the underground rectifier substation.



CEMENTED RIBS AND FLOOR and bolted roof make a safe, fireproof station for the rectifier. Concrete-block stopping and steel doors at ends of crosscut complete the setup.

types of substation equipment provide flexibility, trouble-free operation and good load-accommodation. The m-g sets can be used singly or in combination, as needed, and are near the portal where maintenance and inspection opportunities are enhanced. The converter is near a new fan that is visited every day. Therefore, the converter also receives a daily inspection. The rectifier can be moved to follow the maximum-load center.

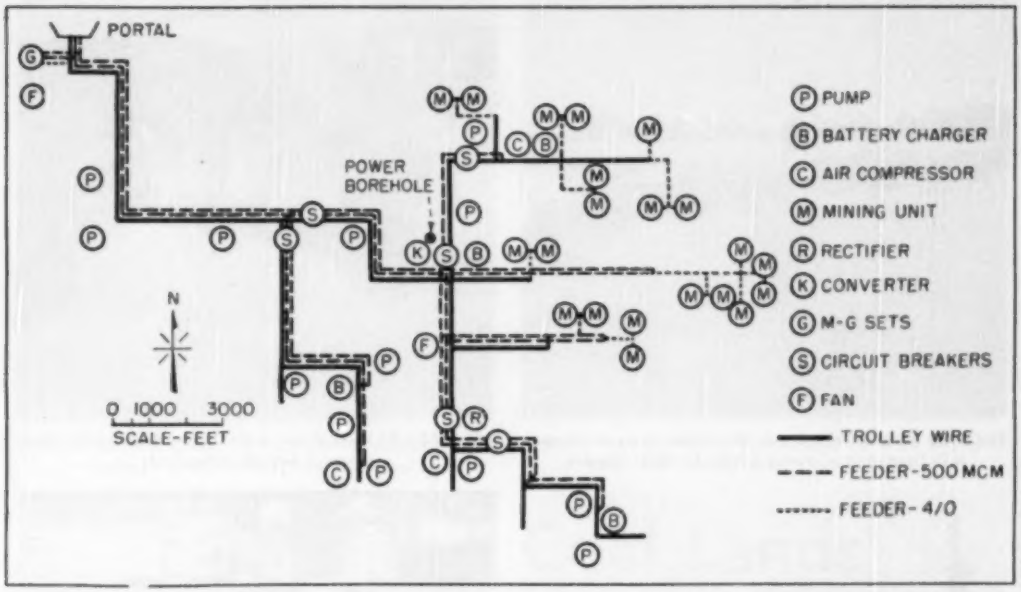
Every attempt is made to keep the rectifier near the load center because of its high operating efficiency and its ability to absorb overloads without undue shock. The pumped-tube rectifier is designed to operate at an over-all efficiency of 93.7% under full load and 92.8% under 150% of full load. Overload capacity of the unit is 150% of full load for 2 hr and 300% of full load for 1 min.

• **Power Distribution** — Ample feeder capacity is provided by the use of twin 500-mcm cables paralleling the trolley system into the working areas. A single 500-mcm cable parallels the trolley wire beyond the end of the twin feeder, and a 4/0 feeder transmits power to loads beyond the end of the trolley wire.

Readings taken in working sections indicate voltages very near the nominal 550 v, and well within recommended permissible-voltage-drop limits. The benefits of good face voltage are numerous. Armatures stay in service longer because the heating effects of low voltage are not present to break down insulation; equipment works at rated capacity, thus keeping production up; and the time of equipment operators is conserved when they do not have to wait for sufficient power.

All power conductors are installed on well-designed insulated hangers throughout Frederick mine. Therefore, they are less likely to be cut by equipment or have their insulation damaged by water or abrasives on the bottom. Good suspension also increases safety for personnel.

• **Circuit Protection**—Ten I-T-E Type KSC automatic reclosing circuit breakers protect the power-distribution system by sectionalizing stub-end circuits to isolate faults, and by separating the substations so that one station cannot continue to feed a fault that has opened a circuit breaker at one of the other substations. The breakers are set to operate at 600 amp and have an overload range of 200 to 1,200 amp.



POWER SYSTEM at Frederick reflects sound power-distribution engineering. Modern equipment, plus good housekeeping and maintenance, keep the long-life, long-distance network up-to-date.

FREDERICK PRODUCTION AND ELECTRICAL SUPERVISORS—Oscar Birmingham (left), mine electrician; Leonard Ford, mine foreman; H. D. Pinkney, mine superintendent; and Frank Caporale, master mechanic.

As shown in the circuit drawing, the circuit breakers are used (1) in the feeder lines between substations to isolate a faulted section so that a distant station cannot feed through to a fault, (2) in the feeder to each mining section to further isolate local faults, and (3) inby the main haulage road served by the substation at the mine opening so that power interruptions in the mine will not affect movement of coal to the surface.

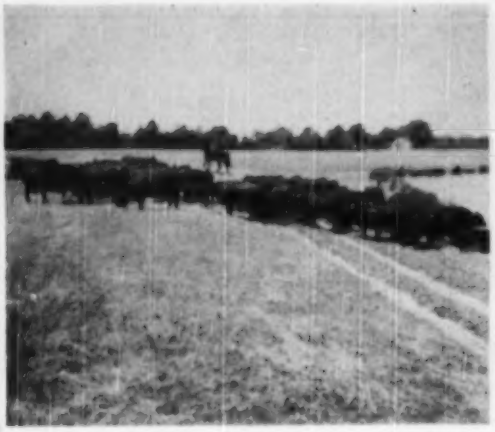
Trouble-shooting when a power-line fault occurs is much easier because the distances to be covered in locating the source of trouble are greatly reduced. Time saved in this manner is added directly to operating time.

Operating officials of the company's mining department agree that the present power distribution system at Frederick is giving excellent service. The system is flexible, it is protected and it puts ample power where it is most needed for efficient operation.

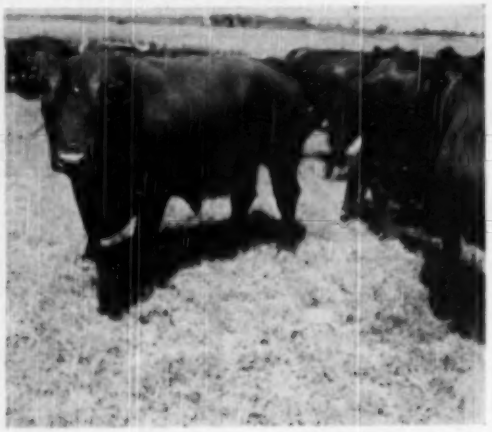
• **Management**—The mining department of C. F. & I. operates six coal mines, two iron mines, one fluorspar mine and two limestone quarries. G. H. Rupp, manager of mines, with headquarters in Pueblo, is in charge. He is assisted by R. L. Hair, general superintendent of fuel mines. W. J. Schenler is chief engineer, and J. W. Irwin, electrical engineer.

At Frederick, H. D. Pinkney, mine superintendent, is assisted by Leonard Ford, mine foreman; Oscar Birmingham, mine electrician; Frank Caporale, master mechanic, and Walter Meek, resident engineer.

Cattle and Hogs Grow Fast on Reserve and Stripped Coal Land

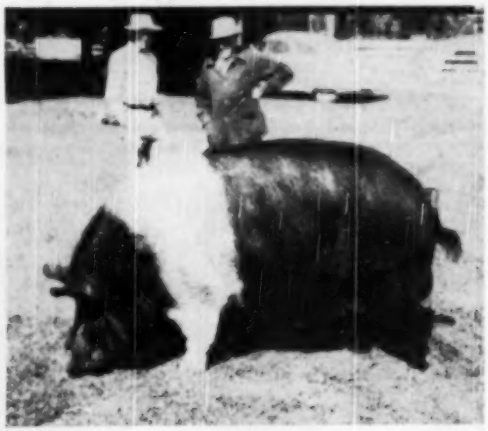


PUREBRED ANGUS CATTLE, over 300 of them, graze on Meadowlark's Denmark farm, reserve acreage for future stripping.



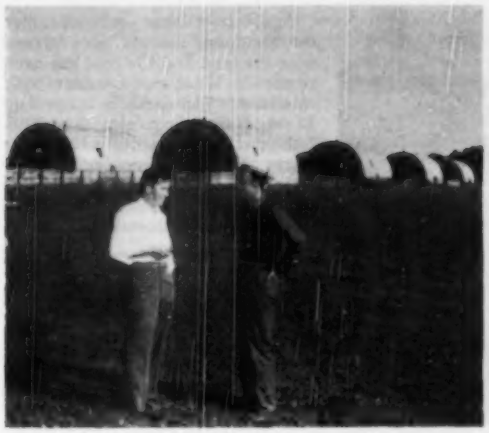
THIS HERD SIRE is one of five on the Denmark farm. Andino clover thrives on built-up pasture land.

PRIZE SOW, Ringgold Lady Dora, shows off her ninth litter at the Clinton farm, where over 800 Hampshires are kept.

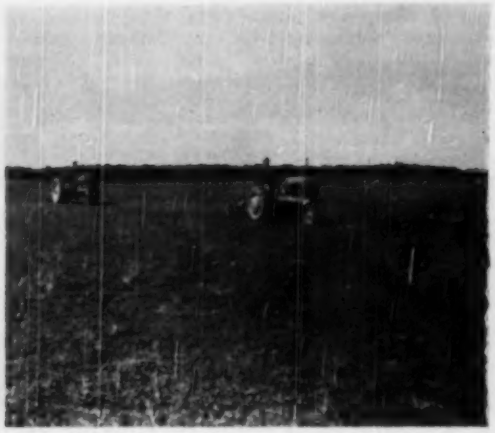


FASHION KING G, 2-star Hampshire boar, weighs close to 1,000 lb. He is a big asset at the Clinton farm.

SOWS AND NEW-BORN PIGS are housed in individual brooders. Indoor farrowing quarters are provided in Quonset barn (left). Farm manager's residence is at the right.



GENERAL MANAGER Reiss (left) and Denmark manager stand in front of 8 Quonsets housing livestock and feed.



PASTURES ARE MOWED at Denmark after cattle are rotated to other areas. Mowing speeds growth of legumes.

Farming on Coal Lands

Here's How A Big Stripper Answers Twin Land-Use Questions

The Questions Are:

1. What Can You Do With Reserve Acreage Before Mining?
2. How Can You Get Best Returns From Mined-Out Land?

THE METHODS { Scientific Study / Sound Planning / Dollar Investment

THE RESULTS { Land Restoration / Profits From Farming / Public Goodwill

By IRWIN H. REISS
General Manager, Meadowlark Farms, Inc., Sullivan, Ind.

IT IS ONLY NATURAL when a farmer sells his land on a sales contract to a strip-mining company that he tries to get everything out of that land that he can while he is still on that farm. This means that he is going to plow up every square foot of that land and put it into cash crops. He is going to forget about plowing down clover and following a good rotation. He isn't going to maintain his buildings or his fences because, in a few years, he will have no further interest in that farm.

And after the coal company gets title to the land, it is only natural for the new owners, because they are not interested in the farm business, to put the land out on a rental basis as long as it will produce something and somebody is willing to pay the rent. When land is in imminence of stripping, I don't see too much radically wrong with that procedure.

Reserves Are Problem

However, the fact remains that there is a definite limit to the acreage of strippable coal. To perpetuate themselves in business, the various competing strip-mining companies try to acquire a substantial portion of these coal lands. Consequently, they hold large acreages that will not be stripped for many years to come.

This so-called reserve acreage, which may not be stripped anywhere from 5 to 100 yr from the time of its purchase, presents a real problem, to my way of thinking, because if exploitation practices are permitted to run their course, there will be lots of rundown farm sites and submarginal land in communities that otherwise would be prosperous.

Please don't misunderstand me. There is much more acreage, never owned and probably never to be owned by coal companies, that has been exploited of its fertility and abandoned because of improper farm practices. I point this out because we need to keep our perspectives in focus.

Meadowlark Farms Plan Makes Best Use of Reserve and Stripped Land

BROODER HOUSES are scattered throughout mined areas. The pigs and hogs graze on alfalfa and sweet clover.

WATER FLOWS into old pits from underground springs at Clinton. At Denmark, 24 stock ponds provide water.

FIR TREES ARE PLANTED in some mined areas. Purdue University works with Meadowlark in this experiment.

Another problem emerges after the stripping shovels have turned over the land and the coal has been removed. What can be done with this land? The earth is thrown up in ridges that vary from 20 to 50 ft in height. The fertility value varies tremendously. Some land is extremely acid and low in available phosphorus and potash, while some is fertile and potentially productive.

Thus, from an agricultural standpoint, the strip-mining industry has to face up to two questions: What do you do with run-down acreage that you are holding in reserve? And can something be done with this land after stripping shovels have passed on?

Making a Start

Some far-sighted men on the board of directors, Ayrshire Collieries Corp., believing sincerely that an economic use could be made of these lands, created Meadowlark Farms, Inc., on Nov. 29, 1945. They charged this new corporation with the responsibility of determining and carrying into practice the proper land use of all Ayrshire acreage both before and after mining. The Meadowlark operation was made a wholly owned subsidiary of Ayrshire and its main office was established in Sullivan, Ind.

As is fundamental in a venture of any magnitude, a survey and appraisal of conditions was made. The first area to receive consideration was a 4,000-acre reserve tract in southern Illinois—our Denmark farm. Because the land probably would not be mined for a long time, we concentrated our efforts here.

What would you do with 4,000 acres of eroded land in the hardpan section of southern Illinois? The fertile topsoil had been washed away. The subsurface had become the surface soil and was completely devoid of organic matter. Below it lay an impervious subsoil that defied the penetration of water and plant roots. The buildings had been dismantled or were in an unserviceable state of repair and the fences had long ceased to serve any purpose.

Land in this condition no longer has productive capacity. We could plow and harrow, seed and cultivate, but the power to produce was gone. That productive capacity had to be restored. The factories of the soil, its structure and texture, the workmen, the millions of micro-

organisms, the raw materials, soil fertility—all these had to be re-created.

We made extensive soil tests to determine what and how much soil treatment was necessary. In an effort to restore the soil, we have spent $20 per acre for limestone, commercial fertilizer and rock phosphate. On this area only, this amounts to over 300 carloads of materials.

Building Up the Soil

Proper soil-utilization principles dictated that we convert this area into a grassland farm rather than produce row crops and again start the ruinous soil exploitation. To harvest grass and roughage crops, we had to have animals. To manage animals, we had to have fences —30 mi at a cost of $26,000—and buildings—eight 40x60-ft metal Quonsets for hay and grain storage and livestock and all the other miscellaneous buildings that are incident to a farming operation. These cost $95,000 to erect.

As for animals, we have 300 purebred registered Aberdeen-Angus cattle along with 200 commercial whiteface cows and heifers and 300 feeder steers that are forming the nucleus of our livestock program. At present, 1,000 Montana ewes and an equal number of lambs help utilize the luxuriant ladino clover and lespedeza pasture. As the productive capacity of the soil and subsequently the carrying capacity of the pastures is increasing, the livestock program is being expanded to keep pace with it.

The entire area is operated on a range basis, with only 10% of the land being tilled annually, and this is done to seed emergency pasture and renovate the permanent pasture. We have built 20 stock ponds to prevent erosion and provide water for this large livestock enterprise.

The response to treatment of this severely abused soil has been amazing and encouraging, especially in light of the knowledge that it originally took nature 10,000 yr to form 1 in of topsoil. These accomplishments in reclaiming the land and establishing grassland farming in southern Illinois have attracted as many as 500 visitors in a single week.

While the developments at our southern Illinois Denmark farm were in progress, we applied the same perspective approach to the mined land in Pike County, Ind. Here we were confronted with extremely acid and rocky land. After a lot of soil testing and a thorough appraisal of the area, it became evident that reforestation was the most feasible use for the land. Somewhere in the neighborhood of 1,000,000 trees, conifers and hardwoods, have been planted on these banks. A full-time forester, member of the Meadowlark Farms organization, supervises the planting and management of these woodlands.

At our Clinton farm, in Vermillion County, Ind., we went contrary to the common belief that only ruminant livestock can utilize roughage and pasture effectively. We have some 800 purebred Hampshire hogs grazing on alfalfa and sweet-clover pasture that was seeded on the mined land. Here, the ridges left by the draglines tested pH 6.5 to 7.0, sufficiently alkaline to support legume seedings. We also feel that the mineral content of the "deep-plowed" or turned-over land is high. The records we have been able to achieve with our hogs seem to substantiate that belief. I am referring here in part to our Ringgold Lady Dora, America's only 9-Star Production Registry sow, whose record has been acclaimed throughout the United States and Europe. Purebred hogs have been sold from this farm to breeders in 10 states throughout the Midwest.

Caring for Livestock

The facilities erected and installed at the Clinton farm are a 40x100-ft central type of farrowing house (this also is the scene of two public boar and gilt auction sales every spring and fall), a 40x80-ft feeding house and a 40x60-ft feed house, where all the hog rations are scientifically compounded and mixed.

At our Clay County farm in Indiana, we have a commercial hog farm where 1,000 hogs are fattened for market annually. These hogs also, like those at the Clinton farm, seem to prefer the vegetation on the mined land to that growing on undisturbed areas.

In Fulton County, Ill., large acreages had been strip mined. At the start of our reclamation program, about 1,000 acres were turned over to Meadowlark. Because this soil was of a wind-blown origin and calcareous in nature, we decided to establish legume pastures. The initial seeding was applied by airplane but subsequent seedings were made with mechanical devices mounted on a tractor.

The seedings of alfalfa, birdsfoot trefoil and lespedeza have been successful. Now, 200 steers are grazing on that pasture and making excellent gains. A farm manager's residence, a 40x60-ft machinery warehouse and a 40x120-ft two-story bank barn have been erected to provide the facilities necessary for a farm operating unit. The arable land on the periphery of the mined land provides hay and grain necessary to feed out the steers after the grazing season on the pasture is over.

Establishment of this 1,000 acres of pasture on the strip banks in Fulton County cost about $15 per acre. Boundary-line and division fences have cost another $6 to $7 per acre. To complete the establishment of this farming unit, we spent about $45,000 for barns, buildings, water system and other facilities.

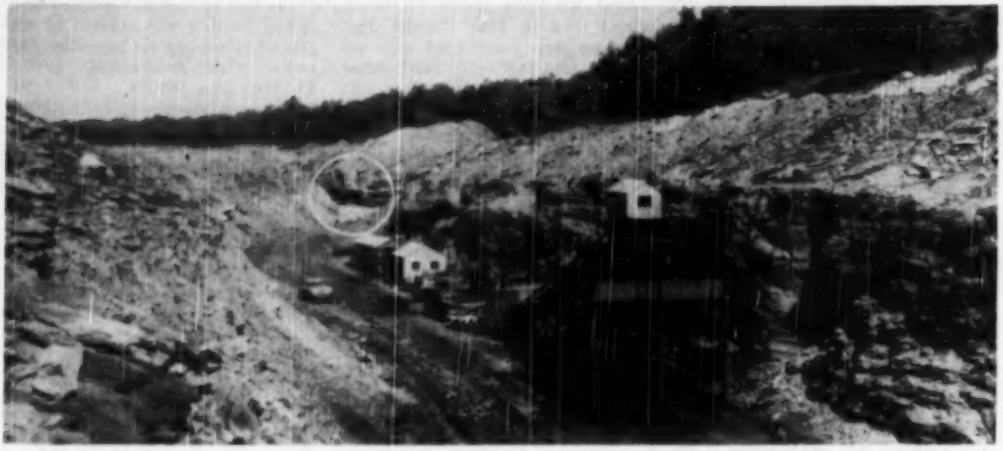
Gains From Land Use

While the cattle-grazing program on these newly established strip-bank pastures has not been in effect long enough for us to gather sufficient statistics for analysis, it is reasonable to assume that two acres will support one animal over a 5½ months grazing period annually. Assuming average gains of 1 lb per day per animal, we would harvest 150 lb of beef per year from two acres. At the present price of beef, this program is certainly an economically feasible venture.

The Meadowlark lands have become veritable game refuges. The many mine pits have been left so as to impound large bodies of water and the vegetation and forests on the mined land provide excellent food and cover for wild life.

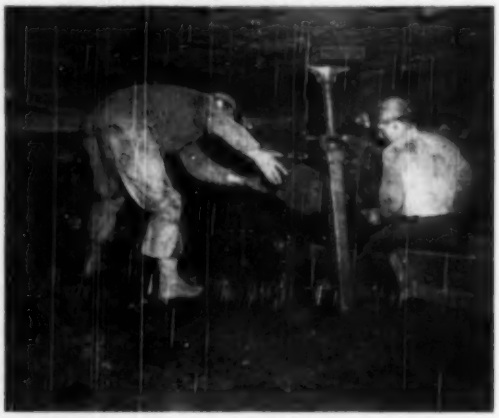
In the rehabilitation of this vast acreage, totaling some 27,000 acres, throughout Illinois and Indiana, we have become keenly aware of the intimate relationship between plants and animals and the production of both on the same land. To maintain the present dietary standard of living for an increasing population, an expanding animal-agriculture program is essential. The Meadowlark Farms accomplishments were made possible by a visionary force, financial backing and technical know-how working together with the laws of nature.

Portable Units Effectively Mine Separate Panels From Strip Pit



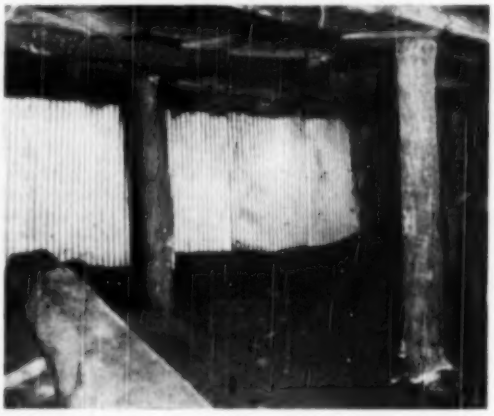
PORTABLE SURFACE UNITS, including tipple, office, power station and fan, are pulled along the highwall to new positions as successive panels of coal left by stripping equipment are recovered. Belt heading (circle) for next panel is being developed.

CHAIN CONVEYORS in rooms and a belt conveyor in the entry move coal from the face to the portable tipple.

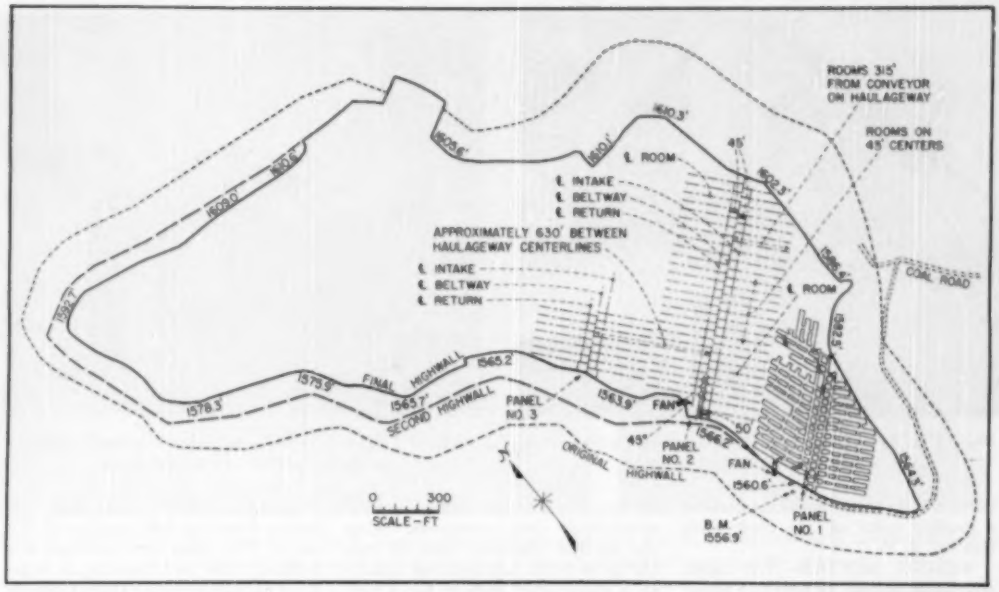


BELT HEADING for Panel No. 2 is driven by two men. In room work three men produce about 10 tons per man per day.

UPTURNED RAILS, as pointed out by A. G. Butler, mining engineer, serve as skids under the power station and other units.



CORRUGATED ALUMINUM nailed to board frames forms stoppings along both sides of the belt heading.



MINING PLANS and projections for future panels show Bradford Coal Co.'s methods for deep recovery of small coal deposit that could not be economically stripped. Mining begins at the low corner of the property to favor natural drainage.

Strip Pit Becomes Main Entry at Aurora No. 6 Mine in . . .

Deep Mining Into Highwall

Low Equipment Investment, Simplified Planning and Servicing, and High Recovery Mark Bradford Coal Co. Methods — Portable Surface Units and Underground Conveyors Complete Extraction Started by Stripping

USING PORTABLE SURFACE EQUIPMENT and underground conveyors, the Bradford Coal Co., Bigler, Pa., is successfully recovering about 90 acres of the Moshannon seam at Aurora No. 6 mine, following the removal of about 60 acres by contour stripping. The outcrop of the 39-in-thick seam was stripped to the economic limit completely around the ridge, and the pit along one side of the hill now corresponds to a main entry in a deep mine.

"Butt" entries, from which rooms are driven on both sides, are opened into the highwall and driven to the other side of the 1,000- to 1,100-ft-wide property. Air, electric power and services are provided from skid-mounted units at the openings, these units being pulled to a new location along the highwall when a room-and-entry panel is completed.

Chain conveyors in the rooms discharge to a belt conveyor, which, in turn, discharges to a portable tipple at the opening in the highwall.

Management primarily responsible for this plan of deep mining from a portable surface plant include R. S. Walker, president and general manager; A. G. Butler, mining engineer; and W. S. Merrow, mine superintendent. The advantages are:

1. The initial investment for equipment can be held to a minimum consistent with the limited life and the small acreage to be mined.

2. Each panel becomes a small separate mine, thus simplifying ventilation, power distribution and mine projection.

3. High recovery is possible with combined strip-and-deep-mining methods, thus fulfilling conservation demands.

EQUIPMENT — Underground equipment at Aurora is as follows:

Five Jeffrey 35B cutting machines with 7-ft bars.

Five Jeffrey 61AM chain conveyors, each 300 ft long.

A Jeffrey 52B belt conveyor with 30-in-wide Homocord belting. The belt conveyor is 1,200 ft long.

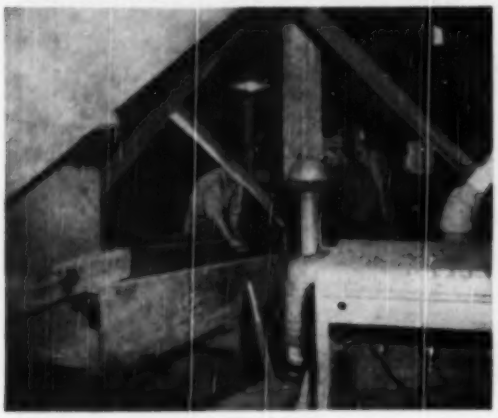
Portable surface units are as follows:

A power station housing two 60-kw 250-v Ready-Power generators, each driven by a 6-cylinder International UD18-A diesel engine.

A fan house with a 4-ft Jeffrey Aerodyne fan operating at 750 rpm and furnishing 12,000 cfm at ½-in wg.

A portable tipple consisting of an elevating 30-in belt conveyor that deposits the discharge of the main belt into either of two 20-ton bins,

How Strip Pit Serves as Main Entry for Deep Mining Into Highwall



HAND PICKING and crushing to 1¼-in slack is done in the screening plant at the railroad loading point.

MARKETABLE COAL flows to the car and plant refuse is carried to the elevated bin for later truck disposal.

from which trucks haul the coal to a loading point on the New York Central R. R.

MINING SYSTEM—The area now being mined, as noted, is about 4,000 ft long and 1,000 to 1,100 ft wide.

Triple-heading entries are started into the highwall on 50-ft centers, this distance being reduced to 45 ft after the openings advance about 50 ft. The center opening, which is the belt heading, is 12 ft wide, and the airways are 15 to 18 ft wide. Bottom is taken in the belt heading to provide 4 ft of height for a travelway.

Rooms, 25 to 30 ft wide on 45-ft centers, are turned to the right advancing and are driven about 315 ft from the belt. On retreat, similar rooms are driven to the left from the belt heading. Pillars are not taken at present because the nature of the roof rock makes it impossible to achieve complete extraction. A complete set of three entries with rooms on both sides permits recovery of coal from a panel 600 ft wide and 1,000 to 1,100 ft long.

The initial panel is now near completion, and one of the chain conveyors has been moved to the next projected belt heading, 630 ft along the highwall from the present beltway. This conveyor is developing the center heading for the next panel. A Farquhar portable conveyor loads coal from the development conveyor into trucks.

When the first panel is finished, a D-8 Caterpillar tractor will pull the skid-mounted surface units into position at the new openings.

Three men work with each room conveyor and present production is 10 tons per man per day. The men move their own conveyors, using the cutting machine ropes to pull the drive units into position. Usually, a single shift suffices for a conveyor move.

FACE PREPARATION—A 2-in binder about 8 in from the bottom is the only impurity in the high-quality Moshannon seam. The cut is made in the coal under this binder and the kerf is cleaned. The binder drops into the kerf and is loaded out in the entries and gobbed in rooms. The coal is somewhat friable and cuts easily with bits that are boron-tipped at the company's shop.

Shotholes, 7 ft deep, are drilled with breast augers and each hole is charged with 2½ sticks of du Pont Lump Coal CC permissible.

Timbers consisting of 10-ft-long collars supported by three posts are set on 4-ft centers in rooms. In addition, four Duff-Norton safety jacks are used in each place as temporary supports near the face.

The conveyors and cutting machines are operated from separate power feeders so that an interruption in conveyor operation will not interfere with face preparation. The conveyors can be controlled from either end or by a master switch at the mine opening to prevent room conveyors from discharging to an idle belt. The conveyors and belt are placed on the line through Ohio Brass magnetic starters.

In addition to the 15 production men, Aurora requires an outside man at the belt transfer and a supply man. The man at the belt transfer oversees truck-loading and picks impurities from the main belt.

VENTILATION—The fan exhausts from the left heading of the entry. The other two headings are intakes. The belt heading is bratticed on both sides so that it can be isolated in cold weather by a seal at the opening to prevent the belt rollers from freezing.

Stoppings in the crosscuts on both sides of the belt heading are constructed of corrugated aluminum on wood frames. They are quickly installed and readily reclaimed for use in the next panel.

PREPARATION — Contract truckers haul mine-run coal from Aurora No. 6 and a nearby stripping to the weighing-screening-loading plant on a railroad siding at Deer Creek, Pa. After weighing, the coal is loaded directly from a special truck ramp or dumped into the bin above the screening plant.

The product of the screening plant is hand-picked 1¼-in slack.

Coal dumped into the bin passes through a 10x10-in grizzly, oversize lumps being broken by hand on the grizzly. A reciprocating feeder under the bin feeds the coal onto the shaking screen. Minus 1¼-in coal passes through the screen onto a belt conveyor which transfers these fines directly to the elevating car-loading belt conveyor. Plus 1¼-in lump is hand picked on the screen, then crushed to minus 1¼ in by a single-roll crusher and fed to the elevating conveyor.

The shaking screen is driven by a 4-cylinder International gasoline engine, and the conveyors are driven by a single-phase 10-hp Wagner motor.

Samples from the face and the loaded cars help management keep a running check on quality.

POST-MOUNTED ROCK DRILL sinks 60-ft holes to lower openings for trouble-free face drainage. T. Beveridge (left), machinist at Kyler mine, and H. Biondi demonstrate drilling procedure. Closeup shows important features of the set-up.

Northwestern Mining & Exchange Co. Had a Pumping Problem, But Now . . .

Boreholes Provide Good Drainage

The Situation—Entries Driven to Dip in Middle Kittanning Seam, 60 Ft Above Worked-Out Lower Kittanning, Were Getting Underground Water at the Face

The Problem—Pump Power Requirements, Supervision, Maintenance and Transportation Added to Production Costs and Interfered With Efficient Mining

The Solution—Small-Diameter Boreholes Through the Interval Between Seams Carry Water to the Openings Below, Thus Relieving Pumping Problems

How the Solution Developed

A DRAINAGE PROBLEM at Kyler mine, Northwestern Mining & Exchange Co., DuBois, Pa., was the subject of conversation between C. A. Peterson, assistant to the vice president, and D. M. Doughman, chief mining engineer, during their return to the company office from an inspection visit at the mine. Inflowing water was gathering at the face of each main entry and interfering with operations. These development entries are being driven to the dip in the Middle Kittanning seam, 60 ft above previous workings in the Lower Kittanning. The rock between the seams is interbedded sandstone and shale with pyrite inclusions in balls, lenses and bands.

Keeping the water under control was accomplished by 16 plunger pumps, each 50 gpm capacity. It was felt that projected development would increase the number of pumps beyond reason. High costs for pump power, additional labor for pump maintenance and attendance, and transportation difficulties compounded the problems.

Mr. Peterson, whose mining experience includes service in anthracite mines where water problems and multiple seam mining are the rule, suggested experiments with boreholes at frequent intervals to the lower workings as a possible solution, providing an economical means of drilling the holes could be devised.

The water from the pumps in the upper seam was being discharged through a couple of diamond drill holes into the lower seam from which it flows by gravity to the surface. However, it was thought that drilling of diamond drill holes at frequent intervals would be too expensive.

Mr. Doughman felt that the company's exploring drill should be tried first, so that its performance could be rated and necessary im-

Shop-Made Accessories Feature Kyler's Drainage Drill

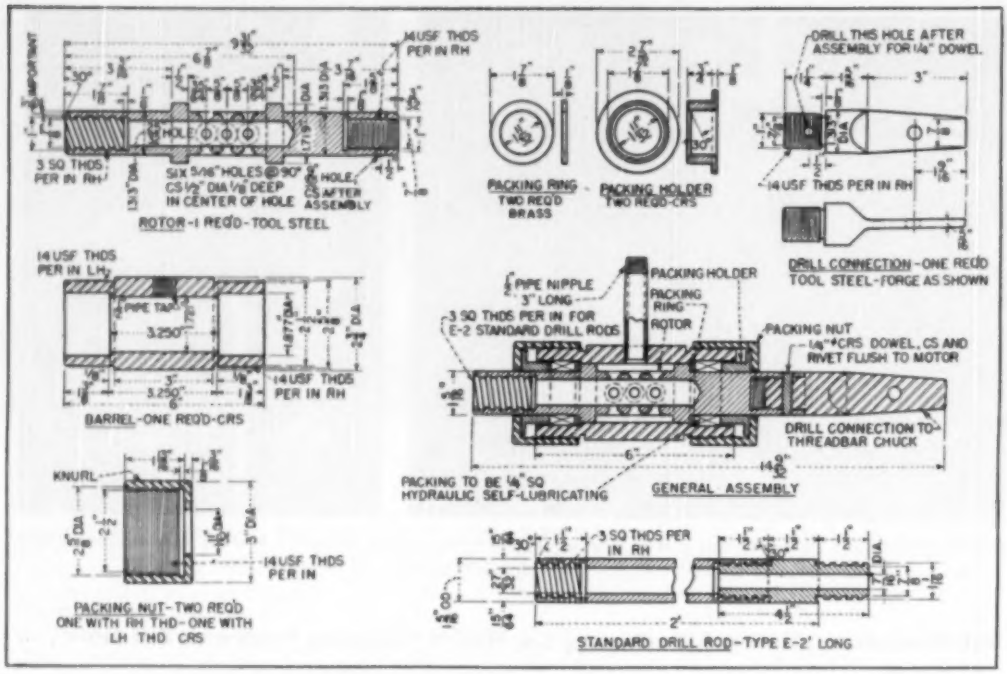

IMPORTANT
14 USF THDS PER IN RH
HOLE
3 SQ THDS PER IN RH
SIX 5/16" HOLES @ 90° CS 1/2" DIA 1/8" DEEP IN CENTER OF HOLE
HOLE CS AFTER ASSEMBLY
ROTOR - 1 REQ'D - TOOL STEEL
PACKING RING TWO REQ'D BRASS
PACKING HOLDER TWO REQ'D - CRS
DRILL THIS HOLE AFTER ASSEMBLY FOR 1/4" DOWEL
14 USF THDS PER IN RH
DRILL CONNECTION - ONE REQ'D TOOL STEEL - FORGE AS SHOWN
14 USF THDS PER IN LH
PIPE TAP
3.250"
BARREL - ONE REQ'D - CRS
14 USF THDS PER IN RH
PIPE NIPPLE 3" LONG
PACKING HOLDER
PACKING RING
ROTOR
3 SQ THDS PER IN FOR E-2 STANDARD DRILL RODS
PACKING NUT
1/8" CRS DOWEL, CS AND RIVET FLUSH TO MOTOR
DRILL CONNECTION TO THREADBAR CHUCK
PACKING TO BE 1/4" SQ HYDRAULIC SELF-LUBRICATING
GENERAL ASSEMBLY
KNURL
14 USF THDS PER IN
PACKING NUT - TWO REQ'D ONE WITH RH THD - ONE WITH LH THD CRS
3 SQ THDS PER IN RH
STANDARD DRILL ROD - TYPE E - 2' LONG

FIG. 1—WATER GLAND ASSEMBLY links threadbar to hollow drill rods so that water for washing cuttings out of the hole can be fed to the bit. This is one of the more important components of the drill rig.

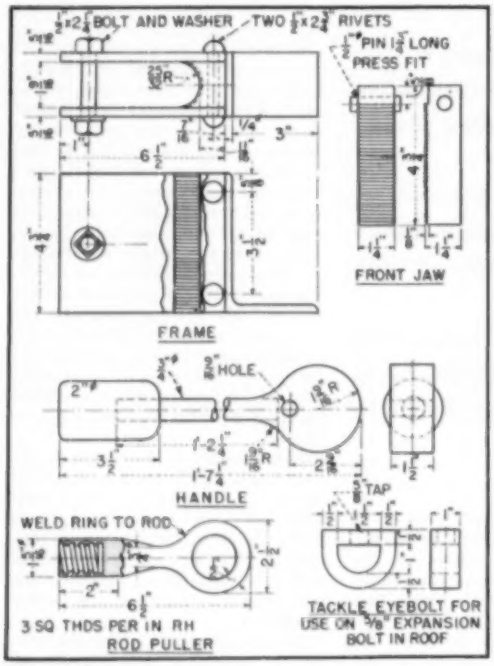


FIG. 2—ROD-RAISING EQUIPMENT plus block and tackle promote safe, quick recovery of rods and bit after the hole is completed.

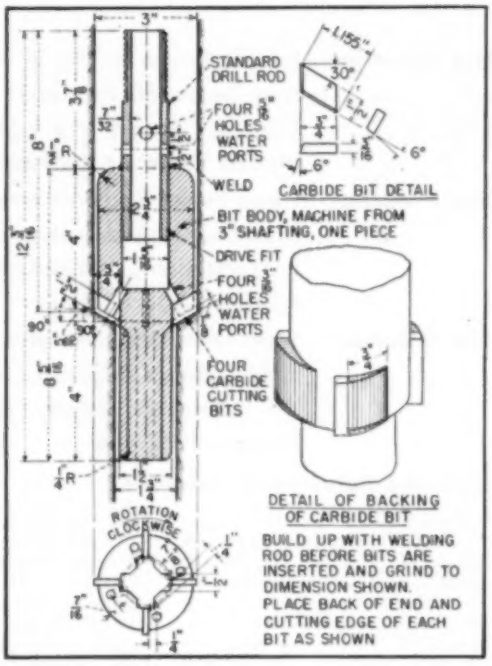

STANDARD DRILL ROD
FOUR HOLES WATER PORTS
WELD
BIT BODY, MACHINE FROM 3" SHAFTING, ONE PIECE
DRIVE FIT
FOUR HOLES WATER PORTS
FOUR CARBIDE CUTTING BITS
CARBIDE BIT DETAIL
ROTATION CLOCKWISE
DETAIL OF BACKING OF CARBIDE BIT
BUILD UP WITH WELDING ROD BEFORE BITS ARE INSERTED AND GRIND TO DIMENSION SHOWN. PLACE BACK OF END AND CUTTING EDGE OF EACH BIT AS SHOWN

FIG. 3—REAMER is designed for opening a 1¾-in hole to 3 in. A stream of water from the ports washes cuttings down the hole.

provement made on the basis of this initial experiment. The exploring drill is used in those openings requiring 20-ft advance holes in face and ribs as a precaution against sudden inrushes of gas or water, as required by Pennsylvania mine law. It consisted of a hand-held 1½-hp electric coal drill, extra-heavy ½-in galvanized pipe for drill rods and an auger-type coal bit. To adapt it, a hole was drilled through the center of this bit and water for washing cuttings out of the hole was introduced to the drill column through a packing gland designed and built by company personnel.

This assembly was tried but the bit was not satisfactory. A coal bit with hard-metal inserts replaced the auger, and then two weeks of heart-breaking drilling produced the first 1⅞-in drainage hole to the lower openings.

Overcoming Drawbacks

This first attempt spotlighted the obstacles to be overcome. The electric drill overheated because it was too light for the work. Drilling with the hand-held unit was laborious. Rod breakage was a constant problem. But the bit was entirely satisfactory in drilling through the 60-ft interval, so it was decided to put more power behind the bit and try again.

A post-mounted 3-hp electric rock drill with threadbar feed was chosen as the power unit. The homemade rods of extra-heavy ½-in pipe were replaced by hollow diamond-drill rods and a larger packing gland was designed and made. The packing gland assembly (Fig. 1) is one of the more important elements in the drill rig because it has a double function of admitting water to the hollow drill rods and serving as a rotating link between rods and threadbar chuck. Commercially available glands commonly used in diamond drilling admit water at the top of the drill column, but threadbar feed prevented the use of such a gland.

The bit was made by cutting the square shank from a 1⅞-in coal bit equipped with carbide inserts. The square shank was replaced with a piece of shafting welded to the head of the bit, and this new shank was threaded to fit the standard drill rods. Finally, a ⅜-in hole was drilled longitudinally through the bit to pass water for washing cuttings out of the hole.

A reamer (Fig. 2) was designed for opening the 1⅞-in hole to a 3-in diameter. Water ports were positioned for most effective hole cleaning by washing cuttings down the hole as they are produced. The reamer was built because it was thought that the small diameter hole would become blocked by debris when in service, but this has not been the case.

In the few instances where blockage did occur it was easier to drill another small hole nearby because reaming to 3 in would require removal of more rock than drilling a new small hole. Consequently, use of the reamer has been limited.

Rod-raising equipment (Fig. 3) for recovering the rods after the hole is drilled completes the drilling outfit.

Designs for the various components were turned over to J. Whamond, superintendent of power and mechanical department, who, together with O. London, outside foreman at Kramer, T. Beveridge, machinist, and J. Bauer, mine electrician, produced the items.

Good Drilling Results

A. C. Williams, mine foreman at Kyler, points out that the improved drill now permits holes to be drilled at a rate of approximately 1 ft per min with a 60-ft hole requiring about 1¼ hr elapsed time. Mr. Williams' persistence was largely instrumental in making the first trial of the drill a success in spite of the difficulties encountered.

Drilling preparations begin with taking down roof to provide 8-ft height for the drill post. The drill is mounted on the post over the point where the hole is to be drilled. The packing gland is secured to the chuck on the thread bar and a rubber-hose water line from a 50-gpm plunger pump is coupled to the ½-in nipple on the gland. This pump keeps the face of the heading water-free until the hole is completed and is removed when the drainage hole is finished. The 2-ft long drill rods are added as needed, the thread bar and gland being retracted after each 2-ft advance in the hole. Drilling is done through the rod-raising frame which rests on the mine bottom at the collar of the hole.

After the hole breaks through into the lower openings, the handle on the rod-raising frame is lifted and the front jaw is dropped into place between the handle and the rod with jaw teeth facing the rod. Lugs on the jaw ride the top of the frame and prevent it from falling through. When the handle is lowered, the cam surface pushes the jaw into the rod and the pressure of a man's foot on the end of the handle is sufficient to hold the entire drilling string suspended in the hole. Then, the gland is disconnected from the top rod and the drill assembly is swung out of the way. Next, the eyebolt is threaded onto a trolley-hanger stud in an expansion bolt in the roof, and block and tackle are hung from the eyebolt. The rod puller is turned onto the top rod and the rods are raised as far as possible with block and tackle after the handle on the frame is lifted to release the rods. The exposed rods are uncoupled after pressure is again applied through the handle, jaw and frame, and this process is repeated until all rods are out of the hole.

A three-man crew has drilled three holes in one shift.

Operating Hints

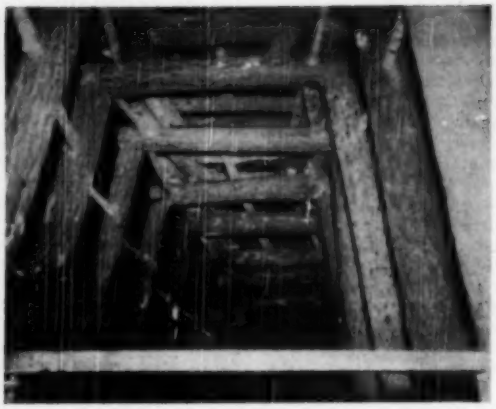
Precautions to be observed are:

1. Be certain that safe practices are followed in taking down roof.
2. Use extra-heavy hose from pump to gland to prevent leaks and bursts.
3. Provide two valves on the discharge side of the pump, one in the line leading to the gland and the other as a relief valve, to permit the pump to discharge to waste without feeding the line to the gland. This relief valve permits rod changing without stopping the pump.
4. Be certain that drillers understand the sequence of using these valves. For drilling, open the line valve, then shut the relief valve. For rod changing, open the relief valve, then shut the line valve.
5. One man in the drilling crew should be responsible for handling the drill clutch to disengage the drill instantly if the bit sticks.
6. Another man should hold the gland to prevent it from turning with the rotating parts.
7. In drilling through soft material the feed rate should be reduced to prevent fouling and possible sticking of the bit.

One of the major benefits the company derives from this drill is a considerable reduction in power costs now that the number of pumps has been reduced to only those needed at the face while a drainage hole is being drilled.

D. R. Marshall, superintendent at Kyler, sums up by stating that under existing conditions at the mine this drill is the best "pump" he ever used.

CONSTANT INSPECTION and strict supervision by competent officials promote safety progress in spite of adverse conditions.



SUFFICIENT TIMBER where it is needed is one of the prime factors in cutting roof-fall-accident totals.

Recent Trends Forecast New Records in . . .

Anthracite Safety

Lower Frequency Rate, Reduced Roof-Fall Toll and Disaster-Free Operation Result From Constant Safety Pressure—Anthracite Becoming Safety Pace-Setter

WHAT ARE the possibilities in coal-mining safety? A look at the progress made by the industry in recent years indicates that they are brighter than even the most optimistic would have prophesied only a short time ago. And a closer look shows anthracite, if not in the lead, at least is close to it and picking up speed as a result of real effort by management, labor and interested commonwealth and federal agencies.

What Anthracite Has Achieved

Here are some of the recent developments in anthracite safety which have not only saved lives and prevented injuries but indicate further strides in the future.

1. **A fatality rate** of 0.62 per million man-hours for the first 8 mo of 1950 was announced by J. J. Walsh, deputy secretary, Pennsylvania Department of Mines, in a recent letter to mine inspectors, officials and workmen. This represents an improvement of 19% over the same period in 1949. While it is somewhat short of the 0.50 rate, Mr. Walsh suggested as a goal for 1950 it is a remarkable record, and achieving the goal in the remaining 3 mo is still a possibility.

Such steady gains, if continued, strengthen the belief that the fatality rate can be pushed down to near 0.16, which, in Mr. Walsh's opinion, is the irreducible minimum for anthracite mining.

2. **The toll of roof falls** appears to be declining. A survey of Bureau of Mines' estimates shows that while production for the first 7 mo of 1950 is running about 4% ahead of production for the same period last year, roof-fall fatalities in the same period have dropped from 25 in 1949 to 22 in 1950. The difference is not numerically great but lives have been saved.

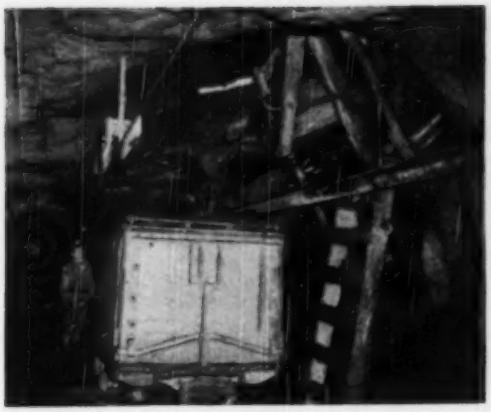
Perhaps a more striking comparison can be drawn between the totals for 1948 and those for 1950. In 1948, production for the first 7 mo was about 30% ahead of production for the like period in 1950 but roof-fall fatalities were more than double the 1950 figure. In the period Jan. 1 to July 31, 1950, 22 men were killed by falls in contrast to the 48 men lost from Jan. 1 to July 31, 1948.

3. **Major disasters,** or accidents in which five or more men lose their lives, are less frequent. The accompanying chart shows how disaster frequency has declined by decades and supports the belief that they can be reduced to the humanly-attainable minimum in the relatively near future. A large part of the credit for the absence of such disasters from December, 1947, to the present time goes to a real effort toward their elimination.

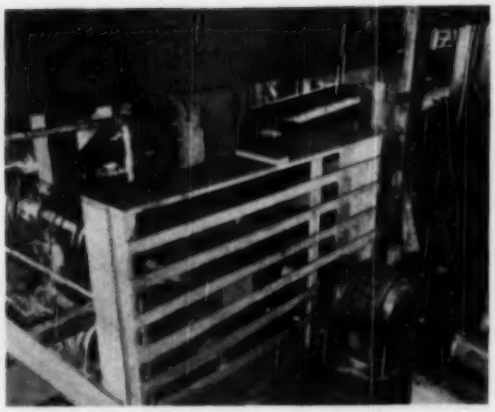
How Accidents Are Prevented

Luck can be discounted. Safety progress in anthracite is a direct result of effort. Conversations with men in the region who have devoted their lives to mine safety lead to this observation. Each is reluctant to take credit for himself or his own program as the major contributor to the excellent records compiled, but is eager to admit that it is the total impact of all safety effort that does the job. Among other things, constant repetition of safety information is having its effect.

Among the standard anthracite practices that have had a major in-



PROTECTIVE CLOTHING on the men and protective guards on mine installations separate workers from possible accidents.



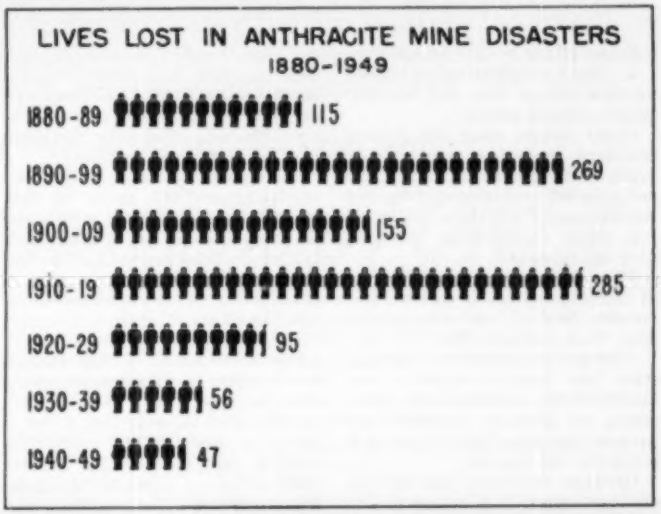
MOVING MACHINERY requires adequate guards in the close quarters normally prevailing in preparation plants.

fluence on safety results are the following:

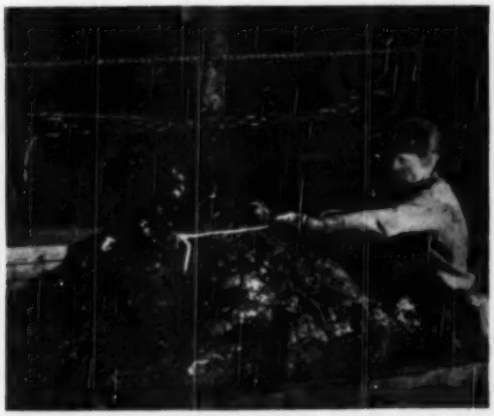
1. Complete independence of safety departments within company organizations. This makes it possible for the department to proceed with accident investigations, safety programs and the assignment of responsibility with the full knowledge that their operations cannot be adversely influenced by anyone. The safety director reports only to the operating chief in most cases.

2. Safety departments staffed with competent, conscientious safety supervisors. Mining experience, physical fitness, comprehensive training and effective support from management help each safety supervisor discharge his duties efficiently.

3. Industry-wide respect for the full-time safety worker—a natural



TRAINING in recognition and elimination of mine hazards helps every man help himself in the campaign against injury.



GOOD WORK HABITS, and proper tools, now accepted without question, keep men out of the statistics.

INTELLIGENT USE AND SOUND INSTALLATION of properly-maintained equipment, adequate lighting and ventilation, diligent dust-control and sufficient support for the roof lead to healthier employees and happier families. Safety investments pay dividends.

outcome of the results he achieves.

4. Close cooperation on safety matters among men and management—a happy reality.

Other factors enter the picture. Standard timbering plans remove much of the element of chance and are especially valuable in removing the element of individual judgment —a major contributing factor in roof-fall injuries.

Wide and continuous availability of training courses in accident-prevention, first-aid and mine rescue keep these subjects alive.

Constant inspections by company, state and federal inspectors are made with the expressed aim of ferreting out physical conditions and personal practices likely to result in accidents and injuries.

Growing awareness that anthracite's problems, in safety as well as in mine operation and labor relations, differ somewhat from those of the coal industry in general leads to concentration on the hazards peculiar to anthracite and on means of eliminating them.

Better training and preparation for the job firmly implant in the mind of each supervisor the conviction that safety is the first consideration. Before men from the ranks or from technical schools are charged with the responsibility and authority for handling a section, they are fully oriented in the importance of safety.

Tight supervision at the face naturally is the most effective means of reducing accident frequency, and companies or collieries with good safety records usually stress this phase of operations. Good supervision and patient teaching have resulted in trained men such as those at a colliery in the northern field which produced under adverse conditions over 2 million tons with more than 3 million man-hours without a fatality.

To repeat, anthracite safety accomplishments add up to an impressive record. But the anthracite man would be the last to admit that the possibilities are exhausted. For instance, Mr. Walsh says this in commenting on the achievements in the first 8 mo of 1950:

"Notwithstanding this worthwhile achievement, I find among the thoughts in my mind one which disturbs me greatly. Will we find at the end of the year that we have failed to establish the anticipated fatality rate of 0.50 per million man-hours? . . . Are we going to find at the end of the year that only the sting of unpleasant memories remain as a reminder of what we should have done?"

The frequency rate suggested as a goal can be achieved if the challenge is accepted and the means for bringing about this desirable result are aggresaively applied.

How To Meet the Challenge

Recommendations for improving safety are usually repetitious. However, time has proved the value of the following steps to improvement in the safety record in anthracite as well as elsewhere:

1. Repeat the safety message at every opportunity. It is important enough to bear repetition and, as noted, it may be the repetition over long periods of time that finally brings about concrete results.

2. Since effective face supervision is paramount in eliminating accidents, it is necessary for each boss to rededicate himself daily to guarding the safety of his men.

3. The roof fall remains the most threatening hazard. Its effect can be reduced only by strict application of such proved procedures as testing, standard timbering and extra propping where any doubt exists.

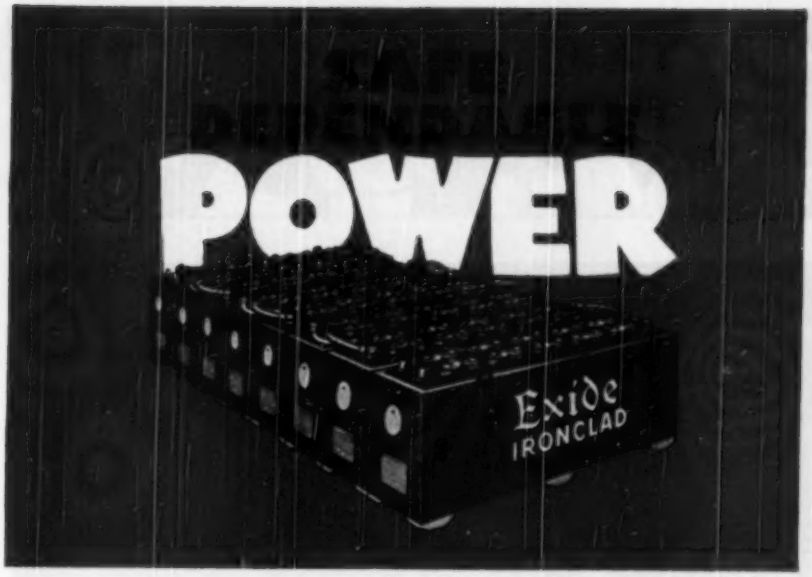
4. Continued training, not only in safety and accident-prevention, but also in the skills, techniques and technical knowledge required, produces alert safety-minded workers.

Safety is a personal matter. The information that has been repeated so often must be accepted and put to use by each responsible person. It is the application of safe practices and not merely the knowledge of them that has helped anthracite to its enviable record.

Moreover, the benefits of a good safety record are quickly recognized. The chill that hovers on a mining town at the time of a disaster is being experienced on far fewer occasions in northeastern Pennsylvania.

Each reduction in fatality totals means that many more happy and healthy families in the region—and that many less bereaved families.

Next to the calamity of being personally involved in a bad accident, there is no more emotionally disturbing experience than the dreadful chore of taking the news of a mine fatality to an unsuspecting family. Only continuing effort to add to the already good record will help reduce the need for such missions.



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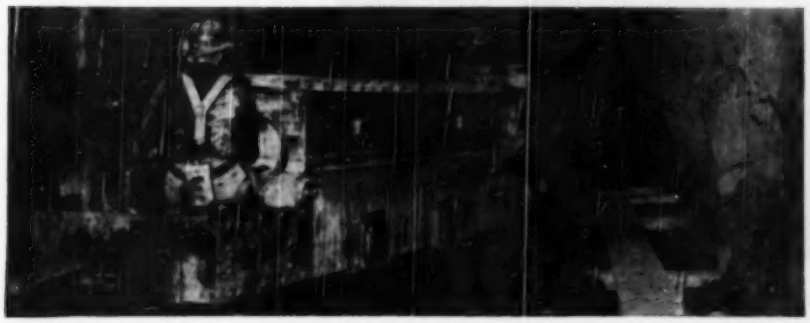
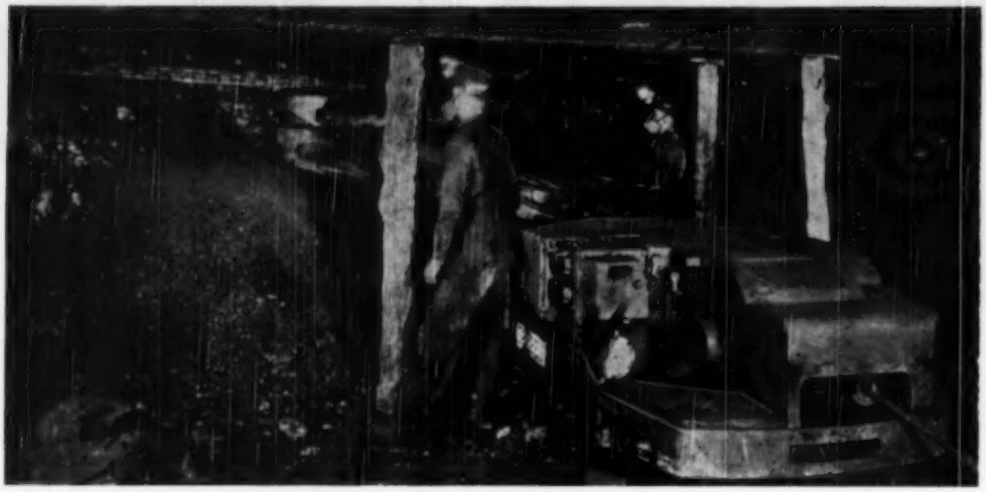
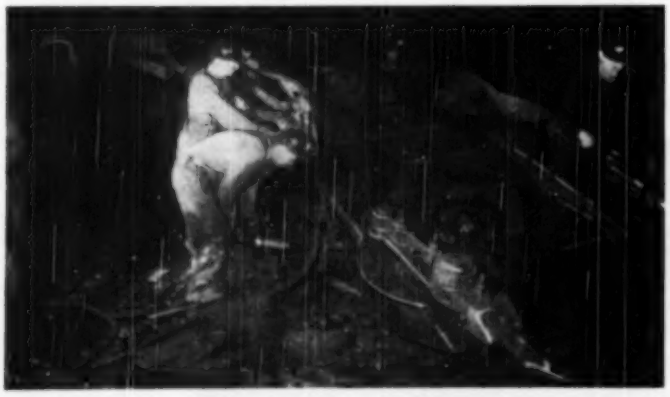




TO KEEP THEM WORKING for a long time to come, plan now for . . .

Better Lubrication

You Don't Have to Make an Extensive Study of Lubrication—It Has Been Done for You—But You Must Apply This Know-How to Get the Most Out of Your Machines



SPECIFIED LUBRICANTS in the right amounts, at the right places, at proper intervals—an operating habit that adds years to equipment life.

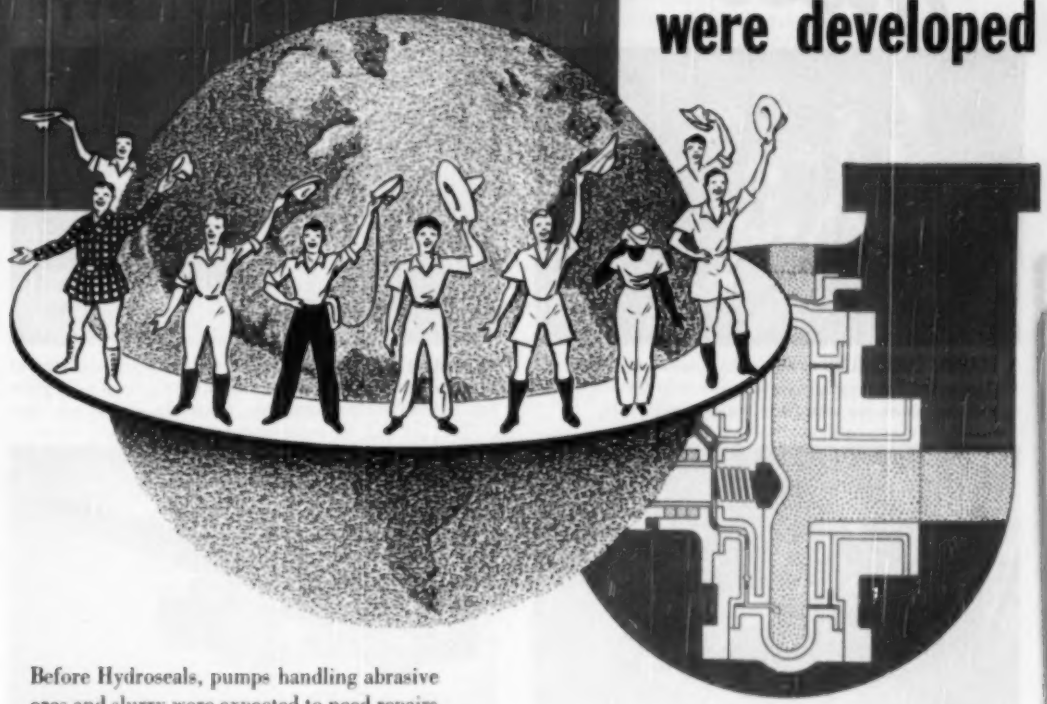
GOOD MAINTENANCE, with the object of conserving mining equipment now in service, will be increasingly important in the immediate future and for some time to come. The reasons for this emphasis on maintenance are making headlines every day. Vivid memories of the industrial shortages caused by demands for national military preparedness make it imperative to get maximum life and service from equipment now in use or on order. By good conservation methods the coal industry can benefit itself and make its usual outstanding contribution to the national effort.

Many factors influence maintenance but the one chosen for expansion in this month's Foremen's Forum is one that is often neglected or mispracticed—lubrication.

The sum and substance of good lubrication includes these three points:

1. Relative motion between parts of machines results in wear, but this wear can be practically eliminated by the insertion of another "part" between the moving surfaces that will have the function of reducing friction.
2. A film of lubricating material

Milling Engineers had a tough time pumping ore until Hydroseals were developed



Before Hydroseals, pumps handling abrasive ores and slurry were expected to need repairs and new parts frequently. Because wear rapidly reduced their capacities, pumps were engineered oversize. So, initial costs as well as maintenance were high.

This picture was changed by the Hydroseal principle and the wear-resisting materials effected by Allen-Sherman-Hoff research. Today, tremendous tonnages of ores are pumped without shutdowns, and at savings in power. All over the world, milling engineers take their hats off to rugged Hydroseals for their efficiency and economy.

No matter what you are h[an]dling or where, our specialists can help y[ou]. Write now.

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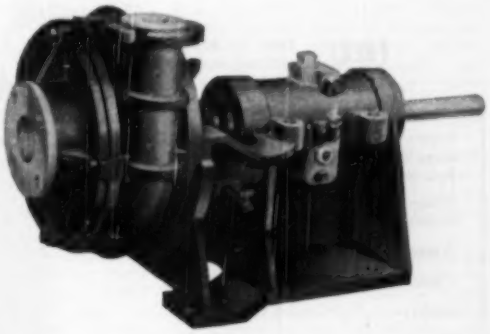
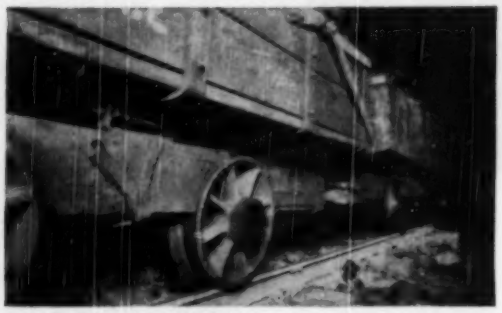


IMPROPER LUBRICATION AT

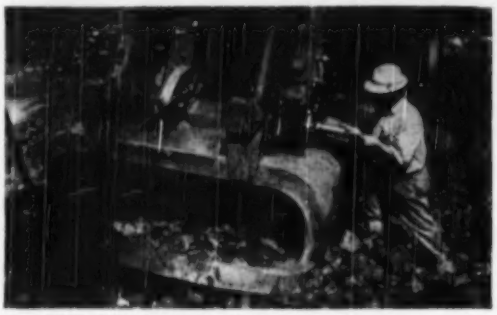
These Four Points

CAN COST YOU PLENTY!

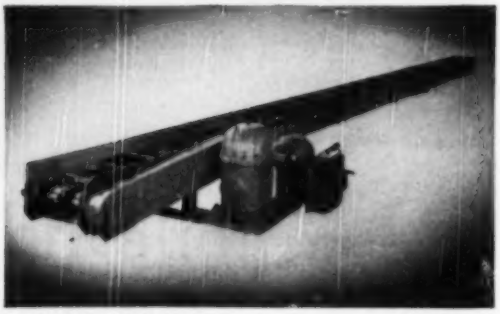
1 BEARING LUBRICATION of automatic loaders. Cities Service Trojan Grease recommendations can help prevent breakdowns, reduce excess wear, save maintenance costs.



2 JOURNAL BOX LUBRICATION. The right grade and type of Cities Service Trojan greases will help keep your mine equipment operating smoothly, efficiently, and at less cost.



3 POWER SHOVEL LUBRICATION. Specific grades of Trojan greases recommended by Cities Service are daily prolonging life and efficiency of strip mining machinery.



4 CONVEYOR LUBRICATION. Critical conveyor lubrication problems have been satisfactorily solved in many cases by the use of Cities Service lubricants.

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QUALITY PETROLEUM PRODUCTS

A REMINDER . . .

COLDER WEATHER IS APPROACHING! Cold weather is normally accompanied by drier conditions in mines, and dryness increases the dust-ignition hazard. While it is important to follow prescribed rock-dusting practices at all times, check your mine or section again to be certain your ignition-prevention measures are all they should be. You might pass this word along to your men. They should be cautioned because perhaps they haven't thought of this relation between cold weather, dryness and the coal-dust hazard.

will effectively serve as the part required to separate the moving surfaces.

3. Lubricants, like other parts of a machine, are specified for the application in which they are to be used, and substituting unspecified lubricants for the proper types is as risky as using improperly designed mechanical or electrical replacement parts.

Greases, oils and solid lubricants, when used in applications where each is particularly suited to the work, prevent wear by their natural ability to cling to metal surfaces, the film thus formed keeping the metal surfaces out of contact with each other.

The action to which the lubricant is subjected may be sliding, rolling, whirling, pounding, scraping or some combination of these. In addition, the lubricant may be required to operate under extremes of temperature, in atmospheres of high moisture or high air pressure, such as steam cylinders and air compressors, or at points where high velocities between moving parts are the rule.

These typical service demands illustrate why it is impossible for one lubricant to be used over the wide range of applications to be found in even one modern mining machine. Therefore, a cardinal rule for lubricating mine equipment is:

Observe the recommendations of the equipment and lubricant manufacturers as to types and grades of lubricants to be used and the frequency of their application. The equipment designer specifies the lubricant for his machine only after consideration of the conditions under which it will operate. Lubricants of any other type or grade may not perform the lubricating function satisfactorily.

Consider, for example, a simple sleeve bearing supporting a shaft. Before recommending the lubricant to be used, the designer will consider the following factors: diameter of the shaft, load on the shaft, speed of rotation, frequency of starting and stopping, materials in the shaft and bearing, and the external conditions that might affect machine operation, such as heat, moisture and dirt. After studying these factors he will select the most suitable lubricant for the application and design a lubricant reservoir, seals and applicator.

The lubricant is an integral part of the machine now, and has been given equal consideration in all the study that led to the final design.

Assume that this machine is placed in service in a mine. As long as it is properly lubricated it will give good service for the longest possible time. But now suppose that the lubrication man, through lack of knowledge, carelessness or error replenishes the oil supply to this bearing with a lighter-than-specified oil. Remember that the recommended oil was specified after consideration of the load on the shaft. It can be readily seen that the lighter oil will not produce a film with enough strength to support the load. Therefore, it breaks down and permits metal-to-metal contact between shaft and bearing. Before long the bearing is worn excessively, the machine breaks down, production stops and essential materials are wasted. Specified lubricants in the right amount, in the right place, at the right time are important!

However, sleeve bearings do wear out even when properly lubricated. The frequency of starting and stopping is a factor here because each time the shaft stops rotating, the oil film between shaft and bearing disappears. The film is soon re-formed by the rotating shaft but at the moment of starting there is metal-to-metal contact.

Ball and roller bearings eliminate this trouble to a great degree so it might appear that lubrication of ball and roller bearings may not be so demanding. Such is not the case! Ball and roller bearings have brought their own lubrication problems.

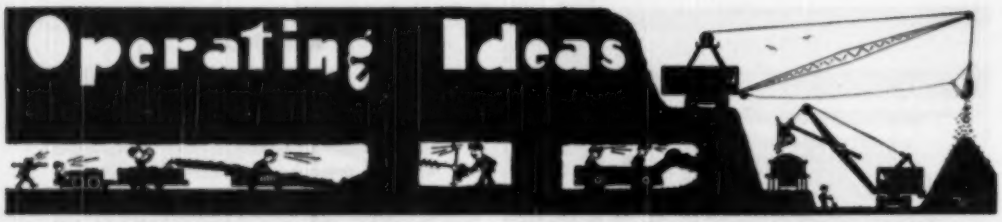
Balls or rollers and bearing races are made of extremely hard alloys and hard alloys are more likely to corrode than softer metals. Therefore, when the designer specifies a lubricant for these bearings he must consider a new factor: "The lubricant must be non-corrosive. Other lubricants, which appear to be similar to the specified lubricant, may lack only the non-corrosive quality, and their use would be detrimental to the bearing.

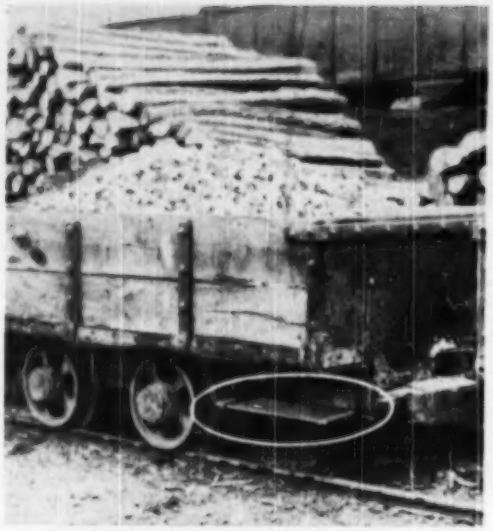
Ball or roller bearings are excellent examples of the importance of using the proper amount of lubricant—no more, no less. They usually are grease-lubricated. Both insufficient grease and excess grease cause overheating. Metal-to-metal contact occurs in an underlubricated ball or roller bearing and early replacement will be a natural consequence. If, in any attempt to solve this problem, too much grease is supplied to the bearing, overheating results again. Here is what happens. Heat is produced in an overlubricated ball or roller bearing because of excessive fluid friction in the grease. This heat causes the balls or rollers, the retainers and the races to expand. The bearing will bind or the inner race will expand to the point where it becomes loose on the shaft. When this happens the race rotates on the shaft and because of its superior hardness causes the shaft to wear. Again, early replacement of an expensive shaft becomes necessary.

Lubrication is the sole subject of many textbooks, so it is conceded that mine supervisors do not have time to make a complete study of the science. However, the information derived from experiments by lubricant and machinery manufacturers is made available to mine supervisors through the lubrication guides that are furnished with new equipment.

The purpose of this Foremen's Forum contribution is to remind foremen that such information should be used to secure the full potentialities of equipment now in service.

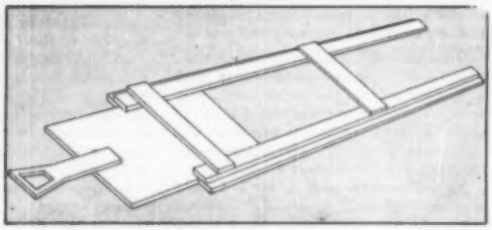
The mine boss' responsibilities in lubrication are these: supervise, inspect and advise. You can discharge all three responsibilities by knowing the lubrication recommendations and applying them to machines under your supervision.





TWO SLIDING DOORS installed on each end of this slag car save 70 min of labor each time the car is unloaded

UNDERSIDE of the slag car, showing a sliding door. About 75% of the ballast is handled without shoveling.



SIMPLY CONSTRUCTED runways and sliding doors can be easily installed on either wood- or steel-bottom mine cars.

Sliding Doors Save 70 Min in Unloading Ballast Car

TWO SLIDING DOORS installed on the bottom of slag cars in use at Montour No. 9 mine, Pittsburgh Coal Co., McDonald, Pa., save 70 min of labor every time a car of ballast is unloaded. With the doors, which were designed and installed by Gaylord Whirlow, master mechanic, and two of his men, about 75% of the material can be emptied over the roadway without shoveling. The first car proved so effective that four more cars have been equipped with the doors. Construction of a ramp to permit trucks dumping the slag directly into the mine cars has provided an additional time saving in loading the cars.

"When our inside foreman told us we had a lot of main-haulage track to ballast with slag, he said there ought to be a quicker, easier and cheaper way than shoveling the slag out of the car," writes Mr. Whirlow, in describing development of the doors. "Shoveling was hard for two reasons —insufficient height, plus of course, the fact that slag isn't the easiest stuff in the world to shovel when you work from the top of the pile.

"I gave a couple of the mechanics several simple ideas on the design and one of our old cars to experiment with. They came up with the car picture here. It has a wood bottom, but the idea can be used on steel-bottomed cars as well," Mr. Whirlow states. Here's the way the sliding doors were built.

First, two holes, about 12x18 in. were cut in the bottom of the car, one at the front end of the car on the right side and the other at the rear end on the left side. The size of the holes naturally depends on the type of car used.

Next, pieces of ½x2-in iron slightly over twice the length of the opening were bolted along the sides of the holes running across the car on top of each, another strip of iron the same size was welded, projecting about ¾ in over the first strip toward the opening, to provide a place for the door to slide. The door is made of ⅝-in plate, the same size as the hole and is equipped with a handle. To provide extra strength, a strip of ⅝x2-in iron is welded across each slide, running lengthwise of the car. A liberal application of grease facilitates operation of each slide.

The handles on the doors are installed so that they do not extend beyond the sides of the car when the doors are either opened or closed. The door on the clearance side pushes in toward the opposite side of the car. The door on the tight side pulls toward the clearance side. Small pieces of iron are attached either to the doors or the slides to prevent the doors from going too far when they are either opened or closed.

Complete emptying of the car without any shoveling at all may be accomplished by placing an inverted V in the bottom of the car, Mr. Whirlow suggests, although that may decrease the capacity of the car somewhat. He plans to try that design as soon as other work permits.

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O-B Shells and Plugs Make Roof Bolting Easier!

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O-B Roof Support Expansion Shells and Plugs were used to bolt this roof.

● Roof bolting is swift when you use O-B Roof Support Expansion Shells and Plugs; first, because the shell and plug unit is mechanically simple; and second, because the unit is easy to handle. Each roof support bolt is installed right the first time without trouble when fool-proof O-B Roof Support Expansion Shells and Plugs are used.

Both the shell and plug are made with no machining other than a tapped hole in the plug. There are no loose parts to handle as the shell and plug unit is turned on to the bolt, and there are no loose parts to slip out of alignment as the bolt is positioned in the hole.

O-B Roof Support Expansion Shells and Plugs provide the easy way for rapid, secure roof bolting, because they're especially designed for the job. If you want bolted roof, you'll want O-B Shells and Plugs. When properly installed, they will develop the full tensile strength of the roof bolt.

Ask your O-B representative for complete information on this simple roof bolting unit, or write to Ohio Brass Company. Ask for Roof Bolting Bulletins.

1 For rapid installation, O-B Roof Support Expansion Shells and Plugs are shipped assembled.

2 The unit as shipped is turned onto the bolt for several full turns.

3 The shell is then separated from the plug, and allowed to rest on its support, ready for installation.

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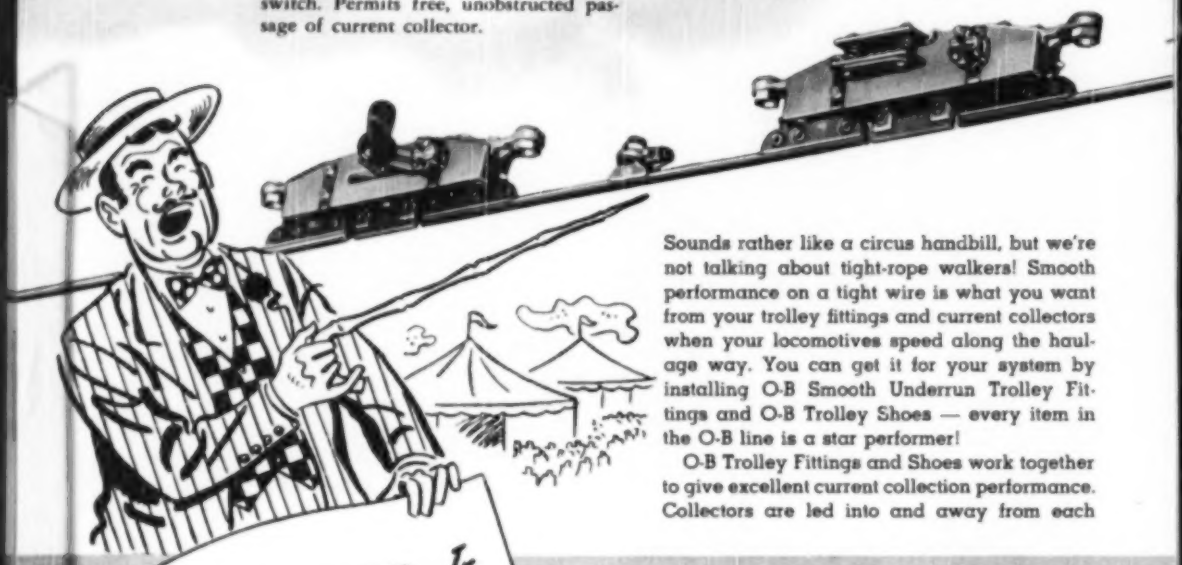
SMOOTH PERFORMANCE

O-B Type T Section Insulator Switch. Identical with Type T Section Insulator with addition of heavy double blade switch. Permits free, unobstructed passage of current collector.

O-B Type T Section Insulator. End runners grip wire by top lobe only. Center runner is adjustable to same underrun level as trolley wire. Long contact surface of shoe allows collector to traverse gaps without bumps or arcs.



Sounds rather like a circus handbill, but we're not talking about tight-rope walkers! Smooth performance on a tight wire is what you want from your trolley fittings and current collectors when your locomotives speed along the haulage way. You can get it for your system by installing O-B Smooth Underrun Trolley Fittings and O-B Trolley Shoes — every item in the O-B line is a star performer!

O-B Trolley Fittings and Shoes work together to give excellent current collection performance. Collectors are led into and away from each

TAP TERMINALS HAVE HIGH CABLE-HOLDING STRENGTH

No. 6 to No. 2/0 Cable Held In New O-B Form-H Tap

Trailing cable is simply, securely fastened in the new O-B Form-H Fused Taps with either of two powerful terminals. Connections are made without forming the wire in any way, for the stripped cable end is thrust straight into a hole in the terminal end. Pressure from two set screws or from a cam then supplies the necessary pressure to keep the cable end in place at all times.

The H-1 terminal, with its two set screws, provides a connection that can be varied from cable-breaking strength to any desired pull-out tension. This variation is accomplished by changing the set screw pressure against the cable end.

The H-2 terminal has a cam which is forced down on the cable end to hold it in place. This holding method does not permit any adjustment of the cable-holding pressure, and after the cam is down, you can be sure that the cable is in place for keeps.

H-1 terminals are made to hold cable sizes from No. 6 to No. 2/0. The H-2 terminals are available for No. 1, No. 2 and No. 3, and for No. 4 cable.

The H-1 and H-2 terminals, with their different clamping methods and wide cable capacities, are interchangeable in the O-B Form-H Taps. This one fused tap can be used for a wide range of power-tapping duties.

Ask to see samples of the new Form-H Fused Taps, with their powerful terminals and versatile contacts. Your O-B representative has a complete set to show you.

ON A TIGHT WIRE!

O-B Bulldog Splicer. Grips wire without encircling. Set screws hold wire in place.

O-B Type M Frog. Anchor tips hold the wire firmly against the runner, producing a smooth, level running surface for the current collector.

fitting without a jar. With no wire-encircling grip; with no jog between the wire and the fitting, the collector enters and leaves any O-B Smooth Underrun Fitting on a wire-level, wire-smooth path. Shoes and fittings work together to do away with bumps. In so doing, they prevent the arcing, wire-burning and pitting that results from rough current collector action.

Install O-B Smooth Underrun Trolley Fittings and O-B Trolley Shoes for your overhead and current collection system. You'll applaud their daily good performance wherever they appear along the haulage way.

O-B Trolley Fittings and O-B Trolley Shoes are a good combination in any overhead system. Assured of their smooth performance, motormen can take advantage of the higher haulage speeds made possible by a good trolley system.

Clamping pressure in the H-1 terminal is provided by two headless hex socket set screws.

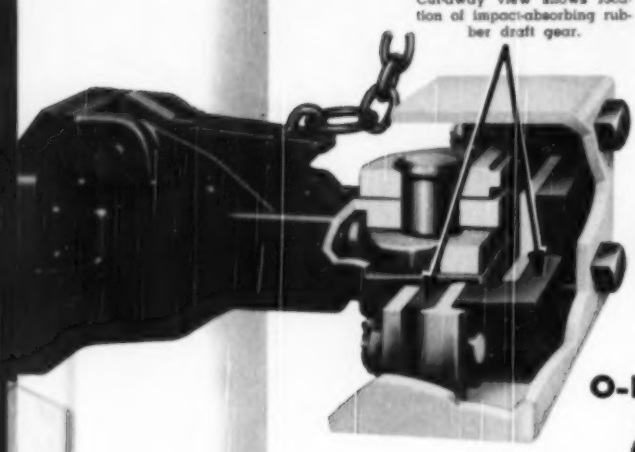
A cam in the H-2 terminal provides great holding strength.

Ohio Brass

MANSFIELD OHIO, U. S. A.

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

HAULAGE WAYS Jr.



Cut-away view shows location of impact-absorbing rubber draft gear.

BUILT TO TAKE A BEATING

O-B Automatic Couplers are Specifically Designed for Rugged Mine Work

Sturdy O-B Automatic Car Couplers stand up to all the abuse encountered in hauling these heavily loaded cars.

O-B Automatic Mine Car Couplers can absorb the worst sorts of blows and literally spring back for more. Tough, resilient rubber draft gear in these couplers has proven to be nearly indestructable because of its elasticity and its resistance to deterioration caused by acid in mine waters. This draft gear will withstand impacts of up to 50,000 pounds—or as much as 100,000 pounds in the Form-8 Coupler. A cut-away view shows the location of this impact-absorbing gear.

Because it is extremely elastic and unbreakable, rubber allows O-B Couplers to stand up to loadings that would break or permanently set steel springs. After years of service, this rubber is untouched by acid mine water, while steel and iron parts in similar service become badly corroded.

Unbreakable, elastic, ***durable*** draft gear is another good reason for replacing old hitchings on your present cars with O-B Automatic Mine Car Couplers. Talk it over with your O-B representative.

4051-M

Ohio Brass

MANSFIELD OHIO, U. S. A.

CANADIAN OHIO BRASS CO. LTD. NIAGARA FALLS, ONT.

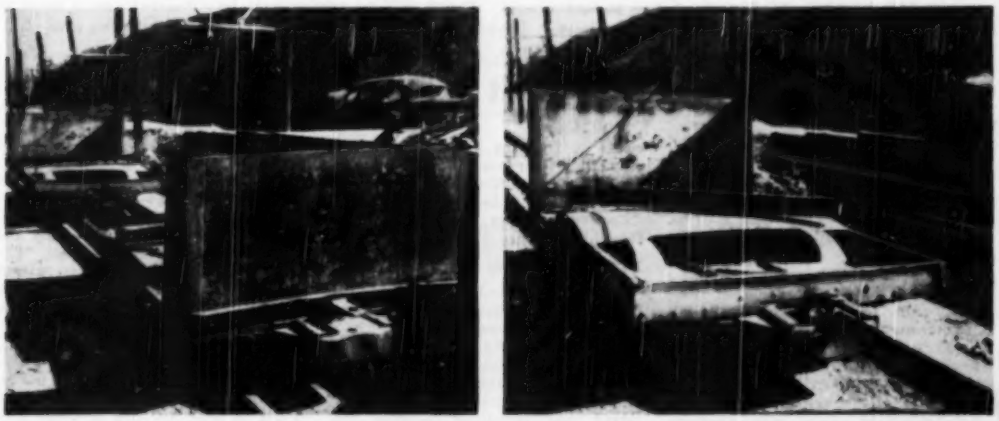
Raising Conveyors From Floor to Crossbars Pays Off

POST-AND-CROSSBAR SUPPORT for main-line belt conveyors reduces spillage, saves power, holds alignment and eases the cleaning problem.

IT PAYS to install main-line belt on conveyors on crossbars supported on posts instead of directly on the mine floor, experience has demonstrated at Bolair No. 1 mine, Pardee & Curtin Lumber Co., Bolair, W. Va. As a result, the post-and-crossbar method was made standard for the mine and 2½ mi of main-line belt conveyors has now been re-installed on crossbars in this manner.

Tests have indicated a power saving as a result of the belt being on a more uniform grade. Other advantages of the system include the fact that the conveyor holds its alignment; there is less spillage as a result of the elimination or easing of vertical curves; and it is easier to keep the conveyor clean.

The posts are 6x8 in and the crossbars 4x6 in. After the bars and conveyor are jacked to the proper level, the bars are bolted to the posts. Placing the crossbars at the most advantageous position anywhere between the floor and the roof eliminates or eases considerably many of the local dips in the belt. Bolair No. 1 mine is in the Fire Creek seam and working height averages approximately 8 ft.



HEAVY STEEL-PLATE ENDS with boxed corners confine materials and protect personnel in case of a wreck. With a long spreader drawbar inserted between the two mine-car trucks (left), the car is spotted ready for loading pipe. The load rests on a bolster in each truck (right), here turned to show how it pivots to take curves.

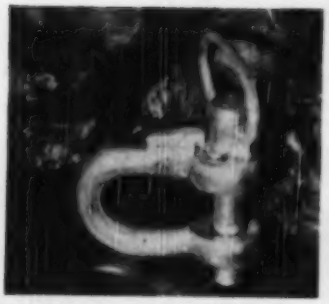
Protected Supply Car Adjusts to Length of Materials Carried

A NEW ADJUSTABLE SUPPLY CAR that is safer and more efficient for handling long materials is now in use at the Piney Fork mine of the Jefferson Coal Co. (a Hanna affiliate), Piney Fork, Ohio. Whether the supplies being handled consist of materials only 12 ft long or rail up to 33 ft, heavy steel plates on each end of the car keep them confined and protect the motorman and others in case of a wreck.

Each end of the unit is a 4-wheeled truck from an old mine car. Spreader drawbars of various lengths are provided to couple the units together as closely as possible to properly confine the particular material being carried.

The load rests on two bolsters, which are pivoted at king pins to permit the unit to travel around curves. Chain-type load binders are attached to the bolsters.

The car was built by John Henderson and Tony Crayzer, on instructions from Harry Corona, outside foreman at Piney Fork.

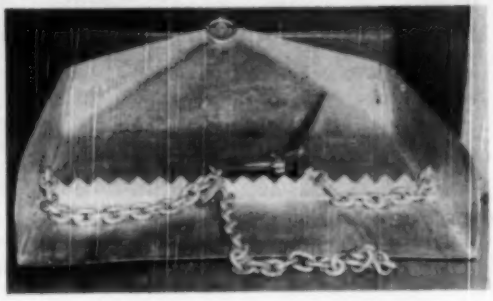


SAFETY CLEVIS AND PIN for safe and speedy rope changes in pitching seams.

SAFETY PIN for the non-link end of a car has a self-closing safety hook.

J. B. HESTER, master mechanic, Winton mine, originated these devices.

GUARD RAIL SUPPORT AND CLAMP cuts wear on hoisting ropes and reduces derailment hazards and delays at turnouts.



TIMBER SLED for pitching seams has a V-shaped front to permit its passing over machine cuts or bypassing standing posts.

Four Mine-Built Devices Permit Safer Underground Operation

J. B. HESTER, master mechanic, Winton mine, The Union Pacific Coal Co., Winton, Wyo., "works at safety for everyone," points out the U. P. *Safety Review*, in describing four of the several effective devices he has developed.

Too often, men about the mines who have jobs that are considered relatively safe "feel that safety is the job of someone else—a responsibility particularly for those who are required to work under more hazardous conditions," the publication emphasizes. It cites Mr. Hester as an example of a non-production official who sincerely believes that "Safe working conditions in and around the mines is everyone's job" and that "The life you save may be your own, irrespective of the job you may be doing."

SAFETY CLEVIS AND PIN—To assure safe and speedy rope changes on pitching seams in Union Pacific mines, the safety clevis and pin illustrated is used to fasten all hoisting ropes to empty and load trips and is attached on the link end of the car.

Its major feature is the fact that the clevis can be detached from the trip under load without any appreciable binding on the pin. The pin can be pulled from the lower part of the clevis to free the link and coupling only when the pin is turned 265 deg in a clockwise direction. A compression spring forcing a key into the slotted collar on the pin prevents the pin from being turned as a result of vibration.

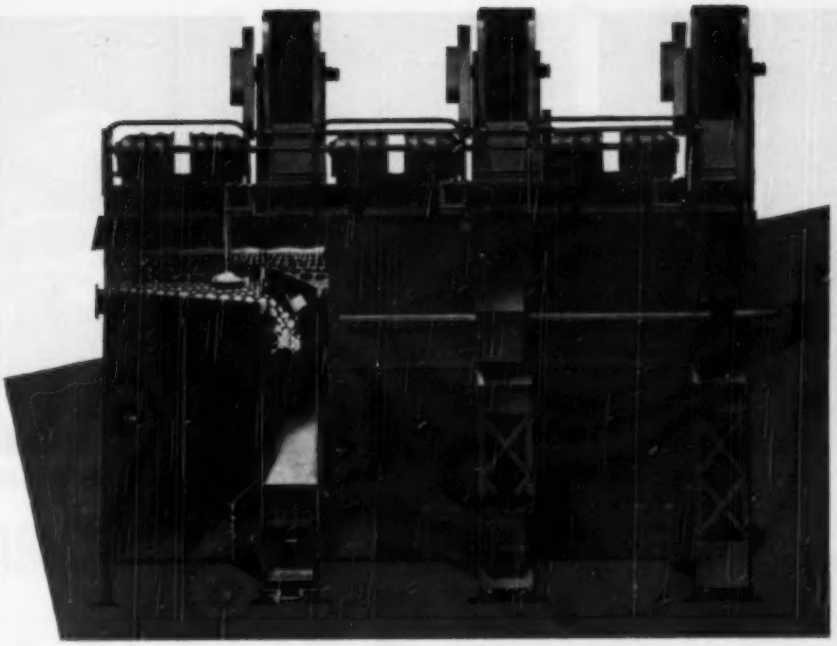
SAFETY PIN—This pin designed for use on the non-link end of a car permits rapid rope changes with a maximum of safety. In operation, as the pin is pulled loose from the drawbar coupling by the handle, the self-closing safety hook is automatically raised and permitted to free the safety catch. When the pin is replaced through the link end of the rope and the drawbar, the irregular curve on the lower end of the safety hook automatically raises the hook, which then is forced into the proper position by helix springs in the swivel of the pin. Once the safety hook is forced into a closed position by the helix springs, it cannot be opened until the pin is pulled out by the handle.

GUARD RAIL SUPPORT AND CLAMP—This unit has been found effective in cutting wear and tear on hoisting ropes, as well as in reducing hazards and delays resulting from derailments at turnouts. It requires only minimum upkeep.

The guard rail clamp is made from two sections of 60-lb rail, with the guard rail held to the track rail proper by an 8-in threaded clamp and nut made from ⅝-in bar stock. The clamp is attached to the outer base of the guard rail and supported by a built-up chock, which supports the inner base of the guard rail.

TIMBER SLED—Used on all pitching seams in the company's mines, this timber sled is made of ¼-in plate, is 2½ ft wide and 3½ ft long, with sides about 6 in high. Its front end is V-shaped to permit it to pass over machine cuts or bypass standing posts without difficulty. The sled is open at the back and has a 1x1-in sawtooth bar welded to the bottom to keep the timber from sliding. The load is securely fastened with a ⅜-in chain and a Stacy load binder, or "Boomer," welded onto the sides. The rope from a 3-hp general-purpose hoist is attached to a chain on the front end.

This timber sled will carry 12 6-india posts of any length and a large number of cap pieces and wedges. It also is a very convenient and safe means of pulling shaker-conveyor pans to the advancing face.



Jeffrey 72" Three Compartment 6-cell JIG with 108 square feet of Screen Area.

No Rewash Jig Required . . . . Middlings Crushed and Retreated in the Primary Jig

THE JEFFREY JIG

(Patented)

THE JEFFREY MANUFACTURING CO.

Established in 1877

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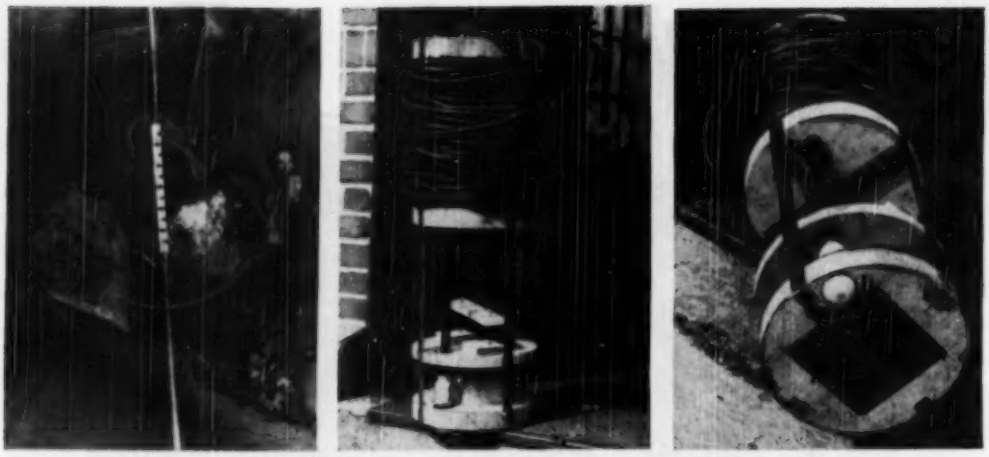
The Galion Iron Works & Mfg. Co., Galion, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio



THIS VIEW of borehole-lining damage, 100 ft below the surface, was obtained from a camera fitted into the assembly (right photos) lowered into the hole. Film in the pre-set camera is exposed when the flashbulb is set off at a predetermined depth.

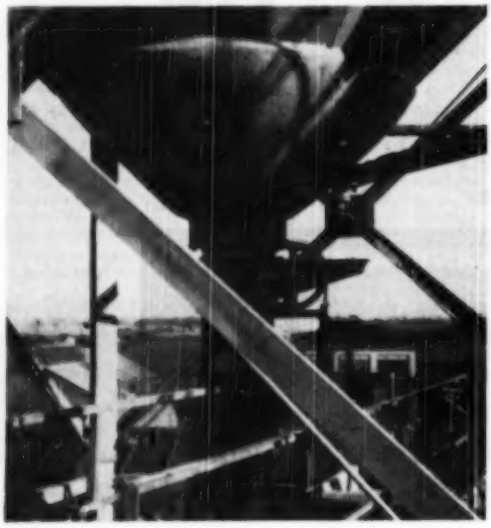
Photographic Trouble-Shooting Aids Borehole Maintenance

WHEN OTHER METHODS FAILED to determine the nature of an obstruction in a 16-in borehole at Avondale colliery, Glen Alden Coal Co., Wilkes-Barre, Pa., R. J. Howell, safety engineer, designed a camera-carrying assembly that could be lowered into the borehole to bring back a photographic record of conditions in the hole. A Leica camera is securely held in the assembly by the block and wing nuts above the second wooden disk from the bottom, with the lens aimed through the truncated pyramid built to accommodate the optical angle of the lens. The Press 11 Flashbulb, projecting from the bottom of the assembly and shaded to prevent glare on the lens, is set off by closing the circuit through the cable that follows the assembly into the hole.

On the Avondale job, Mr. Howell worked under blankets to exclude light. He opened the aperture to f 6.3 and focused the camera for 4-ft distance at the top of the hole. Two men lowered the assembly into the hole with a wire rope attached to the ring at the top of the assembly. At a depth of 100 ft. Mr. Howell closed the circuit to the flashbulb to expose the film. The camera and assembly were then withdrawn and Mr. Howell, still under a blanket at the top of the hole, closed the shutter.

The 100-ft depth and 4-ft focus were determined by previous soundings with a weighted rope. A scale suspended below the camera is useful in determining the extent of damage to lining of the borehole.

Excellent results have been obtained by these methods because good repairs are based on accurate knowledge of conditions.



STEAM-HEATED mineral-wool-insulated tip of coal hopper keeps coal flowing in sub-zero weather.

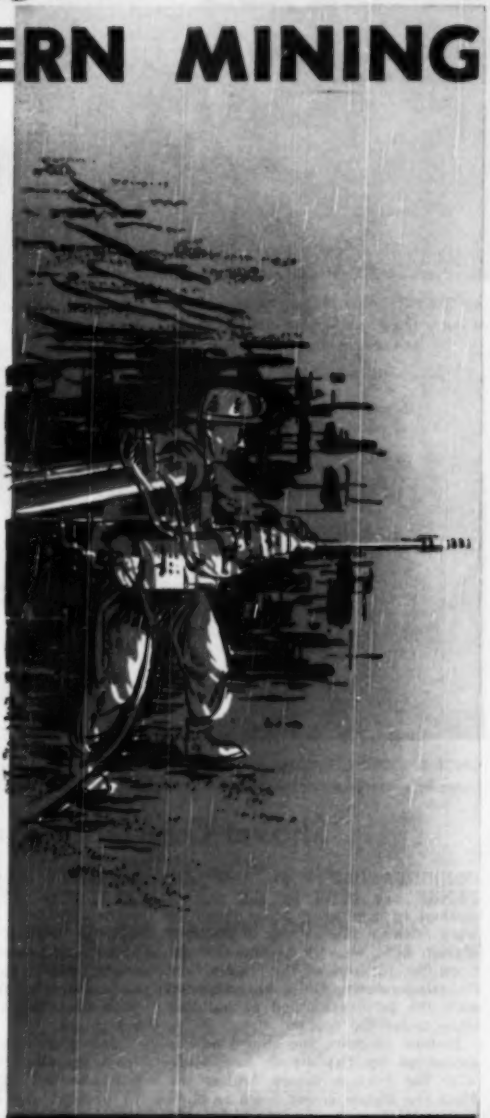
Heated Coal-Hopper Discharge —A Tip for the Winter

BY STEAM-HEATING AND INSULATING only the outlet tip of a 120-ton rooftop hopper, the Stauffer Chemical Co., Niagara Falls, N. Y., keeps coal flowing to boiler furnaces in below-zero winter weather. Copper tubing is helically wound around the outside of the hopper tip to carry steam at 340 deg. Maximum heat at the hopper tip is attained by encasing the heating coil in a mineral-wool blanket.

The mineral wool, with wire-mesh netting on one side and expanded metal lath on the other, is cut to shape and laced at the joints with galvanized wire woven through the abutting expanded lath. A ½-in layer of mineral-wool insulating cement is trowelled onto the metal lath, and a ¼-in layer of fibrated asphaltic emulsion is applied over the cement. After drying, the asphaltic emulsion is painted with a prime coat of aluminum paint and the complete installation is painted the same color as the hopper.

Important to MODERN MINING

LINK-BELT ROLLER CHAINS ON EQUIPMENT FOR DRILLING



Only tough, durable chain can withstand the constant gruelling service of feeding the drill head into the seam without continual breakdowns that idle men and equipment all along the line.

That's why many leading equipment manufacturers feel they can afford to use nothing but the best in chains . . . Link-Belt Precision Steel Roller Chain.

Manufacturers know Link-Belt Roller Chain equipped machines make drilling easy when the going is rough . . . set a fast pace for loaders to follow and slash maintenance costs and down time to a minimum.

Link-Belt Roller Chains provide the ultimate in strength and wear life without sacrificing either one for the other. Link-Belt Sprockets are a fitting companion to Link-Belt Precision Steel Roller Chains.

Get the benefit of Link-Belt engineering know-how today . . . ask an engineer about chain requirements in your operation.

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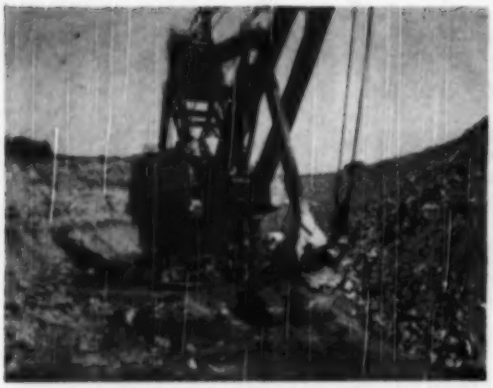
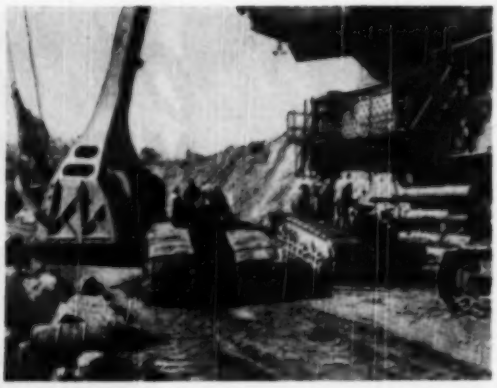
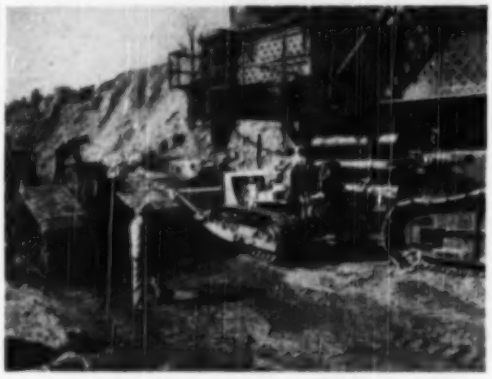
10,116



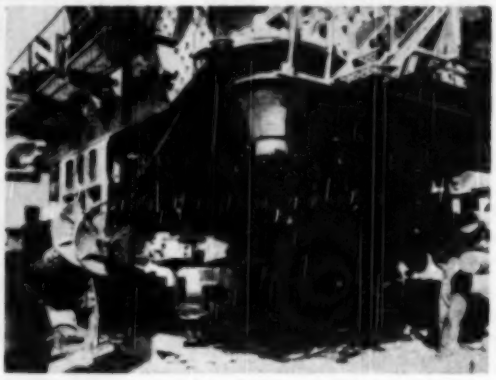
AS THE FIRST STEP in changing a crawler unit without cribbing, the shovel is tilted back and the dipper crowded against the ground and locked to help support the boom and shovel corner.



REBUILT CRAWLER being readied for installation at the left, while other workers disconnect the drive shaft and automatic leveling jack from the worn unit at the right.



ONCE DISCONNECTED, the old crawler unit is pushed out of the way by a tractor, which then pulls the replacement into position.



EXPENSIVE AND TIME-CONSUMING CRIBBING no longer is needed to support the shovel corner while the crawler is changed.

Shovel Crawlers Changed Without Cribbing

CONSIDERABLE TIME AND EXPENSE are saved by the present method of replacing a damaged or worn crawler unit on any of the four Marion 5561 shovels at the Georgetown No. 12 mine of the Hanna Coal Co., Georgetown, Ohio, as compared with the former method of building cribs under the frame.

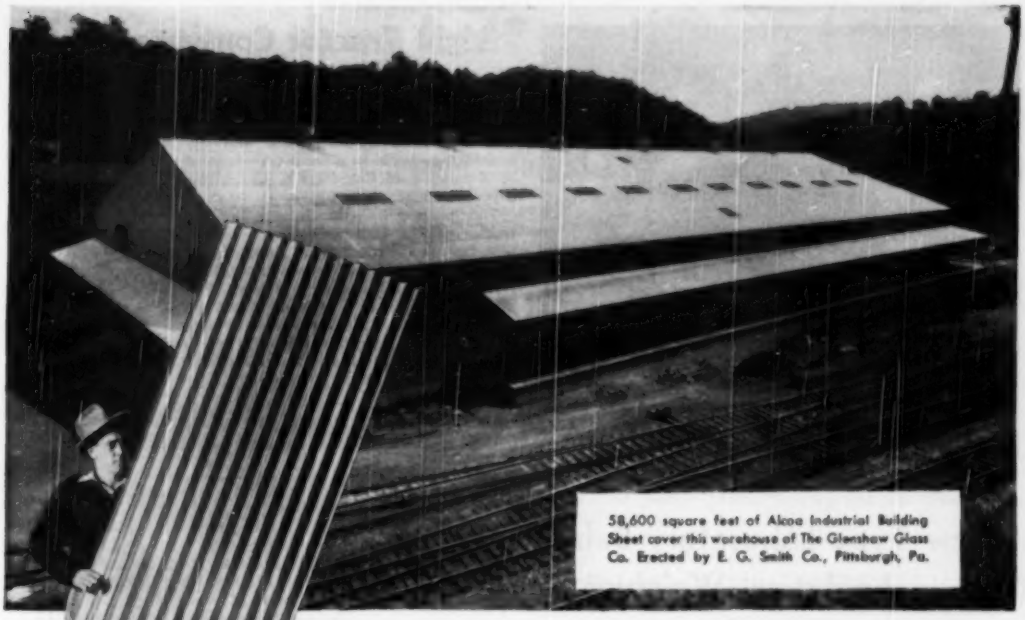
Instead of cribs, the shovel now is supported by the dipper and stick, with the friction crowd brakes set. First the dipper is set down as close as possible to the shovel corner and the crowd actuated to bring pressure to bear on the ground. Next, the automatic leveling is cut out of service and the oil valves to the two leveling jacks nearest the corner to be raised are closed off. The oil then is drained to lower the jack at the far corner and is pumped into the other jack to tilt the shovel. At the same time, the crowd is operated to jack up the boom and assist in the tilting. With the shovel in this position and the crowd brake set, there is no weight on the units to be changed.

Once the drive shaft is disconnected and the leveling jack piston disconnected and raised to clear, the unit is ready to be pushed out of the way by a tractor, which then immediately pulls the rebuilt unit parked nearby into place.

Before disconnecting the worn unit from the shovel is begun, an angle bar is welded between the two frames to prevent the crawler cradle from tipping when disconnected. All the crawler units have been permanently equipped with two welded eyes, to which a wire rope is attached for pulling the unit to and from the central shop.

One complete spare crawler unit is kept on hand for use on the four Marion 5561 shovels, which are equipped with 35- to 50-yd buckets. The accompanying photographs were taken in the 46A "Tiger" pit and the shovel illustrated has a 45-yd bucket.

TO PREVENT the cradle from tipping, an angle bar is temporarily welded to the crawler frames.



58,600 square feet of Alcoa Industrial Building Sheet cover this warehouse of The Glenshaw Glass Co. Erected by E. G. Smith Co., Pittsburgh, Pa.

IT WENT UP *FAST!* IT'S BUILT TO *LAST!*

...IT'S ALUMINUM!

Covered with big, easy-to-handle units of Alcoa Industrial Building Sheet, this building went up fast, was ready for use as soon as the last fastener was installed. It needs no painting now... or ever. Skylights of translucent plastic with matching corrugations went in with the roofing... no frames, no extra glazing required.

If you want speed, if you want freedom from maintenance, if you want corrosion resistance and lasting economy, figure your next building in Alcoa Industrial Building Sheet. For price and engineering data, call your nearby Alcoa Sales office or mail the coupon.

FACTS FOR CONTRACTORS AND ENGINEERS

Alcoa Industrial Building Sheet may be erected over steel or wood; may be fastened by nails, purlin nails, straps, clips, screws or weldable studs.

Lengths: 5 to 12 feet. Widths: Roofing, 35 inches. Siding, 33⅓ inches.

Thickness: .032 inches—equal to 22 U. S. Gauge.

Available for prompt shipment with flat and preformed flashing; all types of fasteners.

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ALCOA INDUSTRIAL BUILDING SHEET

ALCOA ALUMINUM

Light Tractor Converted to Highwall Drill

A LIGHT BUT STURDY highwall drill is the result of adaptations made in a farm-type tractor at the strip mine of Morgan Coal Co., Herrin, Ill., where H. W. Jeffers is superintendent.

The basic unit is an International Harvester Farmall tractor, Model H. Added to it, as shown in the accompanying photograph, is a chain drive from the tractor engine, transmitting power through a model V-8 Ford transmission to the auger. Auger feed is controlled manually by means of a wheel, which in the photograph is being turned by E. M. Armstrong, highwall driller. Augers totaling 60 or more ft in length are cradled and carried on the side of the tractor opposite Mr. Armstrong.

SELF-PROPELLED DRILL for strip-mine highwall is a converted farm-type tractor. Auger feed is controlled by wheel at left.

New-Type Laboratory Balance Slashes Analytical-Weighing Time

SAVING MONEY by letting expensive equipment stand idle might be considered a strange way to do business. Yet, Paul N. Brown, director, Morgantown Coal Testing Laboratory, Morgantown, W. Va., has been very successfully doing just that since 1948 in utilizing a new-type balance to cut by three-quarters the time involved in the 50,000 weighings of coal samples his organization performs yearly.

The laboratory's two chain balances formerly worked 14 hr a day to keep pace with customers' demands. Late in 1948, Mr. Brown purchased a new-type Gram-atic balance which had just been introduced by the Fisher Scientific Co. and found that with it nearly three-quarters of the total weighing time could be eliminated from each day's work. Not only could the laboratory go back on an 8-hr schedule, but purchase of a new chain balance and the hiring and training of a new technician were avoided.

The Morgantown Coal Testing Laboratory is one of the few privately owned and operated coal laboratories in the country. Its business comes from private operators of large and small mines throughout the bituminous fields of Pennsylvania, West Virginia, Maryland and eastern Ohio. From this territory, it receives approximately 5,000 samples each year.

The proximate analysis of each of these samples includes, in addition to the initial sample weighing, four weighings for moisture content, four more for ash, and two for sulfur content. As a result, there is a minimum of 50,000 weighings per year, not including the sample weighings.

NEW-TYPE LABORATORY BALANCE permits precise weighing (four decimal places) in 20 sec.

The chain balances now are reserved for sample weighings only, while the one Gram-atic does all the analytical weighing. Since it permits securing a precise weighing (four decimal places) in 20 sec, the Gram-atic unit is in use little more than half the day.

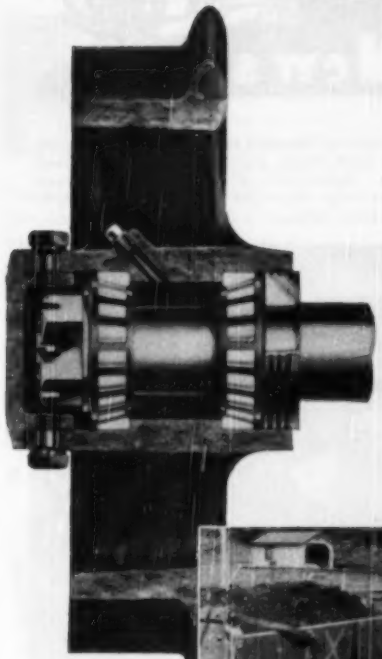
The unusual time-saving feature of this new balance is the result of its departure from conventional balance design. In the place of the usual two pans and three knife edges, the Gram-atic has but one pan and two knife edges. All weights are suspended from the beam and weighing is accomplished by removing weights equal to that of the sample. A system of cans and fingers operated by four control knobs at the front of the balance removes or restores the weights, with the total weight simultaneously tabulated on a direct-reading scale on the front panel of the balance. The first decimal place is read directly from the dial; the second and third appear on an illuminated scale; and the fourth is read from an optical vernier projected on the illuminated scale.

Removing, rather than adding weights, is said to permit the beam to be under constant load at all times, thus giving a constant sensitivity throughout the entire 200-gr range of the balance. Since the operator never touches the weights, they are subject to a minimum of moisture change and no time is lost in fumbling for the right fractional weight.

While Mr. Brown can give no exact figures to show profits or savings directly attributable to the Gram-atic, he does know that the instrument paid for itself in 8 mos and that in its 1½ yr of constant use it has never been out of service for repairs.

WE'D LIKE TO HEAR FROM YOU! Just send us any good idea, "kink" or "gadget" you've successfully put to work at your operation. COAL AGE will gladly pay you $5 or more for each acceptable "Operating Idea" on publication. Address: The Editor, COAL AGE, 330 W. 42nd St., New York 18, N. Y.

Why more than half a million mine cars have rolled on TIMKEN® bearings



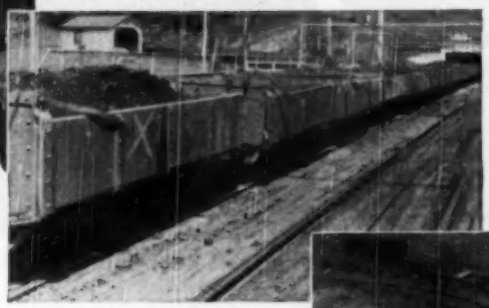
THROUGHOUT the United States, over 500,000 mine cars have been equipped with Timken® tapered roller bearings to insure long bearing life and trouble-free performance. Many of these cars are more than twenty years old and the original bearings still have years of service ahead of them.

Due to the line contact between rollers and races, Timken bearings have tremendous load-carrying capacity—have the rugged strength required for rugged service. Tapered design permits Timken bearings to take both radial and thrust loads in any combination — eliminates the need for extra thrust bearings or thrust plates. Timken bearings reduce friction to a minimum; easier starts and higher speeds are possible. Train lengths can be greatly increased.

Long bearing life is assured with periodic lubrication. All makes of bearings, including Timken, must be regularly lubricated for maximum bearing life.

No other bearing gives you all the advantages you get with Timken bearings. Be sure the mine cars you buy are equipped with Timken bearings—and look for the trade-mark "Timken" on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



STILL GOING STRONG after more than 20 years, these cars, part of the 660 Timken bearing equipped cars at Consolidation Coal Company (W. Va.) Mine 63, Monongah, West Virginia are still moving maximum tonnage at minimum expense on Timken bearings.

MORE THAN TWENTY YEARS ago, these Timken bearing equipped cars went into service at the Castle Shannon Coal Company in Cloverdale, Pennsylvania. Part of a group of 526, they have been rebuilt several times—but the original Timken bearings are still on the go.

POSITIVE ROLLER ALIGNMENT

Wide area contact between roller ends and rib of the cone prevent Timken rollers from skewing. Result: bearings roll easier, last longer.

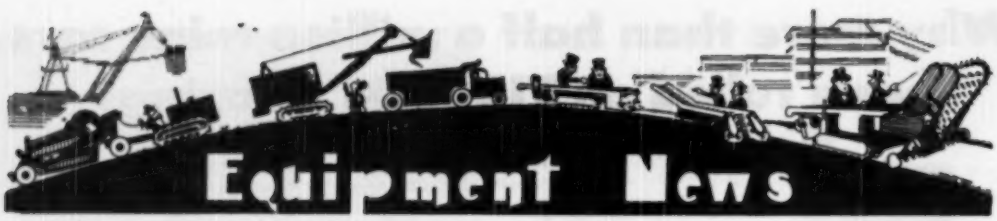
The Timken Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

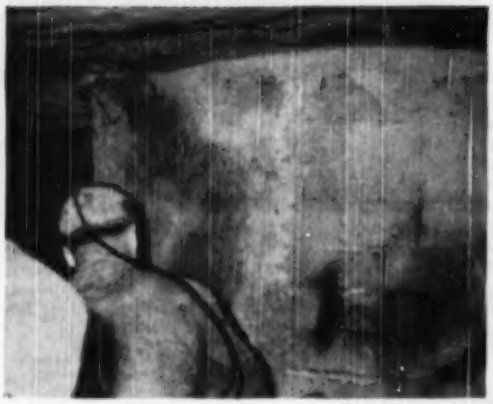
TIMKEN

TRADE MARK REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS

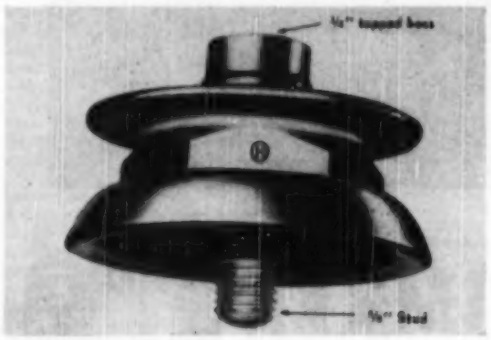
NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST ⊣◫⊢ LOADS OR ANY COMBINATION





Sprayed Plastic Seals Stoppings (1)

Newly available "G.E. Cocoon" plastic may be sprayed with standard spray equipment to form a tough durable acidproof fire-resistant and somewhat elastic cover for coating and sealing concrete stoppings, both temporary and permanent; coating brattice cloth and sealing it to the ribs, floor and roof without caulking; repairing cracks and leaks in overcasts, etc.; and sealing off mine fires. Cocoon-sprayed muslin or brattice cloth may be taken down, rolled up and re-used many times, the manufacturer says. Muslin placed over concrete blocks and sprayed with Cocoon eliminates need of cementing and permits rapid and inexpensive recovery and re-use of the blocks, yet provides a highly effective seal, it is reported.—*Cocoon Engin. Div., R. M. Hollingshead Corp., Camden, 2, N. J.*



Roof Bolts Hold Trolley Hangers (2)

Modified O-B Type K-3 mine hangers can be attached directly to the protruding ends of threaded roof bolts to eliminate the need of drilling extra holes and the cost of extra expansion shells in hanging cable feeder or trolley wire. The hanger has a ⅝-in tapped boss for attachment to a ⅝-in roof-support threaded rod installed in the regular manner. It turns freely and does not affect the roof-bolt installation. Metal parts of the unit are galvanized, with molded insulation over the supporting shell.—*Ohio Brass Co., Mansfield, Ohio.*

Unit Tests Roof-Bolt Load (3)

New Model BT-252 mine roof-bolt pull tester designed for actual on-the-job testing of the bolt anchorage is said to quickly determine whether the bolt will hold the desired load without requiring special test bolts. Built for handling underground, the unit has a 25-ton capacity and may be used with standard roof bolts of ⅝, ¾, ⅞ and 1 in diameter. The hydraulic pressure gage is calibrated in tons for direct reading of the stress applied to the roof bolt. Bolt displacement is easily measured, the company says, and no specific-length or special-design bolts are required.—*Industrial Div., Continental Gin Co., Birmingham, Ala.*

Designed to Save You Work

NO MATTER WHAT YOUR JOB, you'll find some of the 65 new products and catalogs described in this section worth requesting more information about. The postage-free addressed post card facing p 124 is there to serve you by simplifying your request for data and catalogs from several manufacturers, whether you want them for immediate use or on file for future planning. So, as you go through this section, note the numbers of the new products and bulletins that interest you—then simply circle those numbers on the card and mail it to COAL AGE.

ADVERTISEMENT

Matthews, Moore Coal Co. Supt. reports bit cost of .28 of one cent

Mr. Claude Matthews, superintendent, Moore Coal Co., Devonia, Tenn. reports that heavy-duty Kennametal Bits have saved money on cutting time, machine repair, and bit costs. Seventy-five heavy-duty bits cut 2,400 places. Bit cost was reduced to .28 of one cent. A saving of 29% was made on power which lowered upkeep cost on mining machines.

●

Grinding Folder Available . . . FREE

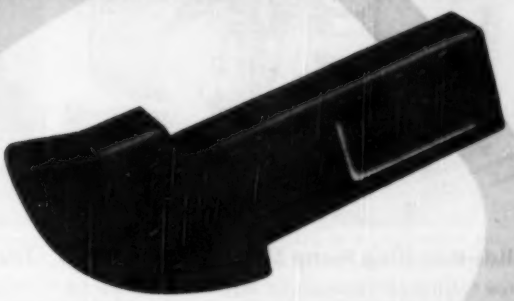
Kennametal Inc., Latrobe, Pa. has fully-illustrated folder offering complete details on how to PROPERLY and economically keep cemented carbide mining machine bits in top cutting condition. Special features: Step by step instructions on grinding, how to tell when bits are dull, how to avoid bit chipping, and what causes carbide bits to crack.

●

43% decrease in power

Power test developed in a Raleigh County, West Virginia mine shows that Kennametal U-8 (heavy-duty) bits required just 57% as much power as the two different styles of steel bits that were tested. Readings were: Steel Bit Y—.40 KWH per ton, Steel Bit Z—.48 KWH per ton, Kennametal U-8—.25 KWH per ton. Test conditions were identical.

Kennametal Bits



SAVE POWER

—help to lower operating cost

Power Problem

How do Kennametal (X) and steel bits (Y) compare?
Ans.: X = 37 H.P./place
Y = 52 H.P./place
X/Y = 37/52 x 100 = 71% (% power needed by X bit) or X bit uses 29% less power than Y bit.

The problem at the left was solved for Claude Matthews, Supt., Moore Coal Co., Devonia, Tenn., by an engineering company that computed the power requirements of steel bits and Kennametal bits. Results showed that steel bits placed 104% of rated load on the machine motor while Kennametal bits required only 75% of rated load.

Kennametal bits save power because they are tipped with Kennametal cemented carbide. It is a cutting edge material that stays sharp 50 to 200 times as long as steel. That is what makes Kennametal the greatest power saving bit in the coal field.

Some mines save as much as 5 and 6 cents per ton on Kennametal bits. These savings are divided up among the amount of bit changing, reconditioning time, bit cost, and repair cost that are saved. Numerous power tests like this one prove that Kennametal bits save 25 per cent or more on power. And power checks are one of the most definite indexes on savings that it is possible to make.

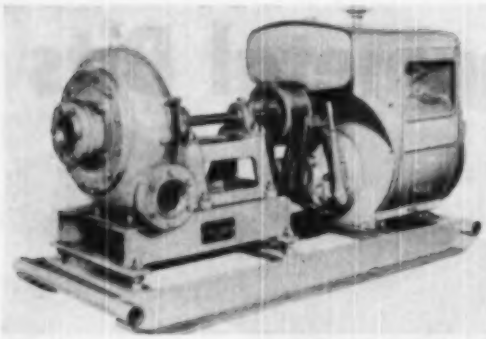
Let a Kennametal representative give you FREE proof that Kennametal bits can mean big savings to you. He specializes in cutting and drilling—is also a likable man with years of experience in the mines.

Contact him today by writing Kennametal Inc., Latrobe, Pa. A postal card and three words, like "send a representative"— your signature— will do the trick. No obligation!

KENNAMETAL®

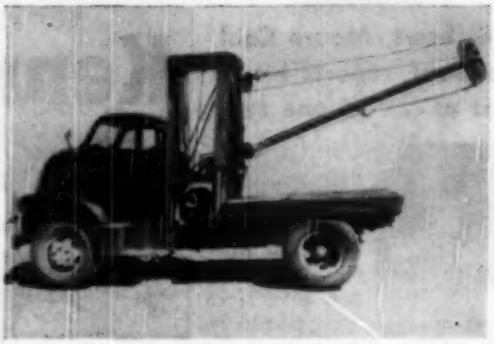
DRILL BITS • MACHINE BITS • STRIP BITS • ROCK BITS

Write us for any information you want on Cutting or Drilling



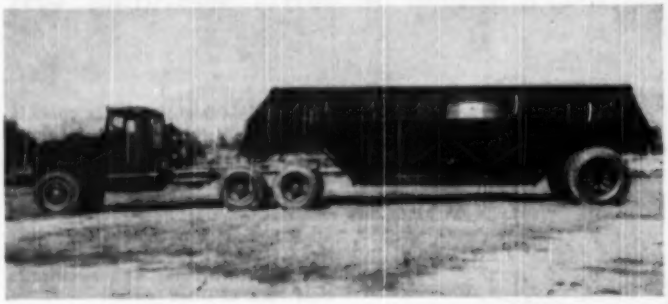
Solids-Handling Pump Skid-Mounted (4)

New "Lightning" skid-mounted engine-driven pump features ready portability in handling water containing solids. To insure speedy operation for emergency pumping, the unit has a self-priming device that utilizes a vacuum developed by the power unit, requiring that the operator open only a single valve. The pumps are available in two sizes; a 4-in unit powered by a 30-hp 4-cylinder air-cooled engine; and a 6-in pump equipped with a 77-hp 6-cylinder radiator-cooled engine.—*Kansas City Hay Press Co., Kansas City, Mo.*



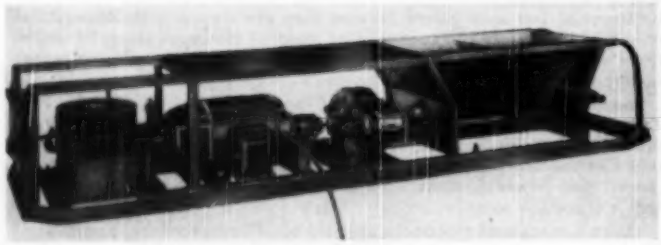
Truck Crane Easily Installed (5)

Applicable to many jobs, new "Hydra-Lift" hydraulic truck crane reportedly can be easily installed on any type truck without special tools and used with any-make winch. Simplified design and hydraulic power cuts initial cost as well as maintenance costs. All swinging and lifting can be simply controlled by the truck driver from his cab with excellent visibility, the maker says. Hydra-Lift takes up only 35 in behind the cab and has a capacity up to 3 tons. Information available.—*Pitman Mfg. Co., Kansas City 2, Mo.*



Coal-Hauler Built for High Capacity (6)

Landis Model S1080 coal-hauling trailer is designed for maximum-capacity haulage from pit to tipple, has a hopper made of ¼-in plate and full-floating springs and torque-arm axle suspension to take rough pit conditions. The unit has a struck capacity of 40 cu yd, weighs 26,500 lb and is 29 ft 2½ in long, over-all. Models are available in various capacities down to 6 cu yd.—*Landis Steel Co., Picher, Okla.*



Portable Rock Duster for Low Coal (7)

Designed to save lifting and back-breaking moving in low coal, "Little Chief" high-pressure portable rock-dust distributor will pull itself onto and along a conveyor or, skid-mounted, pull itself at the rate of 40 fpm. Mounted on skids, the unit is 18 in high and 20 in wide. It is available with rubber-tired mounting and with or without the winch. It uses 50 to 250 ft of 1¼-in hose, which can be rapidly connected or disconnected via a quick-acting clamp. Permissible or dust-tight units may be specified. Various voltages, motor types and power taps available are covered in folder.—*American Mine Door Co., Canton, Ohio.*

Rigid Plastic Pipe (8)

New Carlon L rigid plastic pipe featuring increased resistance to burst at high pressures, tensile strength of 5,100 psi and flexural strength of 9,600 psi, is recommended by the maker as a special-purpose pipe for air lines, for handling liquids, vapors and gases under moderately high pressures and for underground and underwater conduit. Available from ½ to 6 in in diameter, in 20-ft lengths, Carlon L is extremely lightweight and can be easily handled and installed, it is said. It is guaranteed against rot, rust and corrosion, is resistant to most acids and alkalis and will not form a galvanic couple.—*Carlon Products Corp., Cleveland 5, Ohio.*

AMERICAN PERMISSIBLES

Produce an Exact Break... for any seam of coal

Excellent breakage plus other bonus benefits such as speed and economy are yours when you specify AMERICAN Permissibles.

Their *quality* is backed by years of research by Cyanamid. Their *performance* is assured by unremitting care in manufacture coupled with close chemical control. All of these factors combine to produce a complete line which is sure to include an explosive exactly suited to *your* blasting needs.

You can obtain AMERICAN Permissibles promptly from plants and distributing magazines located in key areas... remember, make your next order AMERICAN.

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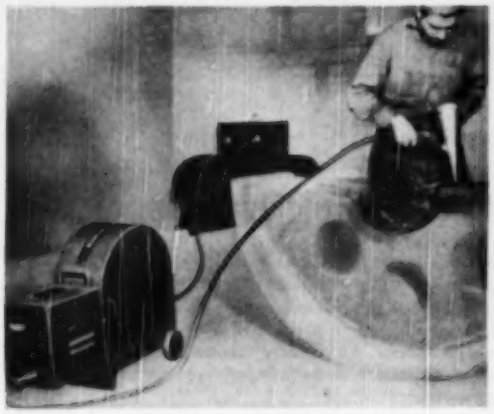
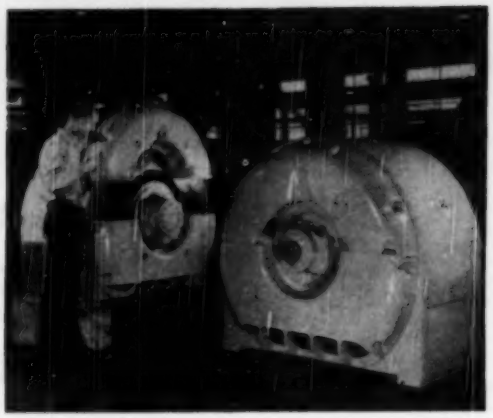


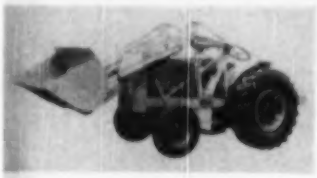
New Unit Uses High Welding Speeds (9)

New "Hidensity" process is said to use high welding-current densities to create a deeply penetrating arc that permits high welding speeds and results in less metal consumption since little or no edge preparation is generally needed. It is applicable to any standard Lincoln Electric SAE 600 or SAE 900 welding generator or an SAE 600 gasoline-engine-driven generator, simply by connecting a new "Manual Lincolnweld ML-2" unit said to provide all the features of an automatic head and to be completely self-contained for use on work some distance from the generator. The new process utilizes electrode wire either 3/32 or 5/64 in in diameter.—*Lincoln Electric Co., Cleveland 1, Ohio.*



Motors Offer Greater Accessibility (10)

The standard Allis-Chalmers line of large bracket-bearing squirrel-cage induction motors of four or more poles has been re-designed to provide more protection and greater accessibility. Features cited by the manufacturer include capsule-type sleeve bearings as standard; simple removal of the upper half of the bracket without exposing inside of the bearing; large stator air-discharge openings protected by removable louvers; a drip-proof design as standard; a uniform ventilation that provides freedom from hot spots and quiet operation. The new motors are available in a variety of types and with special electrical modifications as required.—*Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*



Shovel Loads Faster (11)

The complete line of Lull "Shovel-loaders" has been newly designed and improved throughout to provide maximum operator vision and faster loader operation. Improvements include larger hydraulic pumps, re-designed bucket-control cylinders and more efficient buckets, which are available in a variety of types and sizes. Various interchangeable attachments may be used.—*Lull Mfg. Co., Minneapolis 6, Minn.*

Under-Voltage Protection For Magnetic Starters (12)

Designed for power circuits subject to voltage dips or momentary power loss, a new Under-Voltage Protection System, in which the starter remains locked-in down to a low voltage, thus permitting the motor to re-accelerate if the voltage recovers in 2 sec or less, has been announced by the Electric Controller & Mfg. Co. The circuit, which does not involve added equipment, is available on all sizes of magnetic starters, for both low and high voltages, and is said to reduce work stoppages and restarts. The new UVP circuit holds the contactor closed magnetically down to a low voltage (about 25% of normal) and upon further drop in voltage permits the contacts to break cleanly. The danger of contacts welding under low voltage and the disadvantages of starters equipped with a mechanical latch and a magnetic-tripping mechanism are eliminated, the company says.—*The Electric Controller & Mfg. Co., Cleveland 4, Ohio.*

Motor Speed Preset (13)

General Electric ACA motor (ac adjustable speed) now is available with a mechanical follow-up control for achieving a fixed preset speed without using expensive control equipment. According to the GE Small and Medium Motor Div., the new device permits setting a predetermined speed manually by a knob directly on the ACA motor or at the end of a flexible cable 10 or 15 ft away. The speed adjustment can be made while the motor is either stopped or running. Once set, the control will bring the motor back to the correct speed after the motor has been restarted from a stop or automatic slowdown.—*General Electric Co., Schenectady 5, N. Y.*

Feeder and Conveyor Use New Principles (14)

Two new vibrating machines, said by Robins Conveyors Div., Hewitt-Robins, Inc., to incorporate entirely new principles for producing vibratory motion, include the "Vibra-Feeder" employing mechanical (rather than electro-magnetic) means of operation. The design eliminates many parts, some of which require costly maintenance, and only a 2-amp draw is taken from the ½-hp motor, it is reported. Full details are available in Bulletin 134. The "Vibra-Veyor" conveyor offers balanced mechanical operation without counter-weights and is said to be able to produce from lengths up to 200 ft activated by a single vibrator. Bulletin 135 offers full data.—*Robins Conveyers Div., Hewitt-Robins, Inc., Passaic, N. J.*

EASIER TO SEE...SAFER TO USE

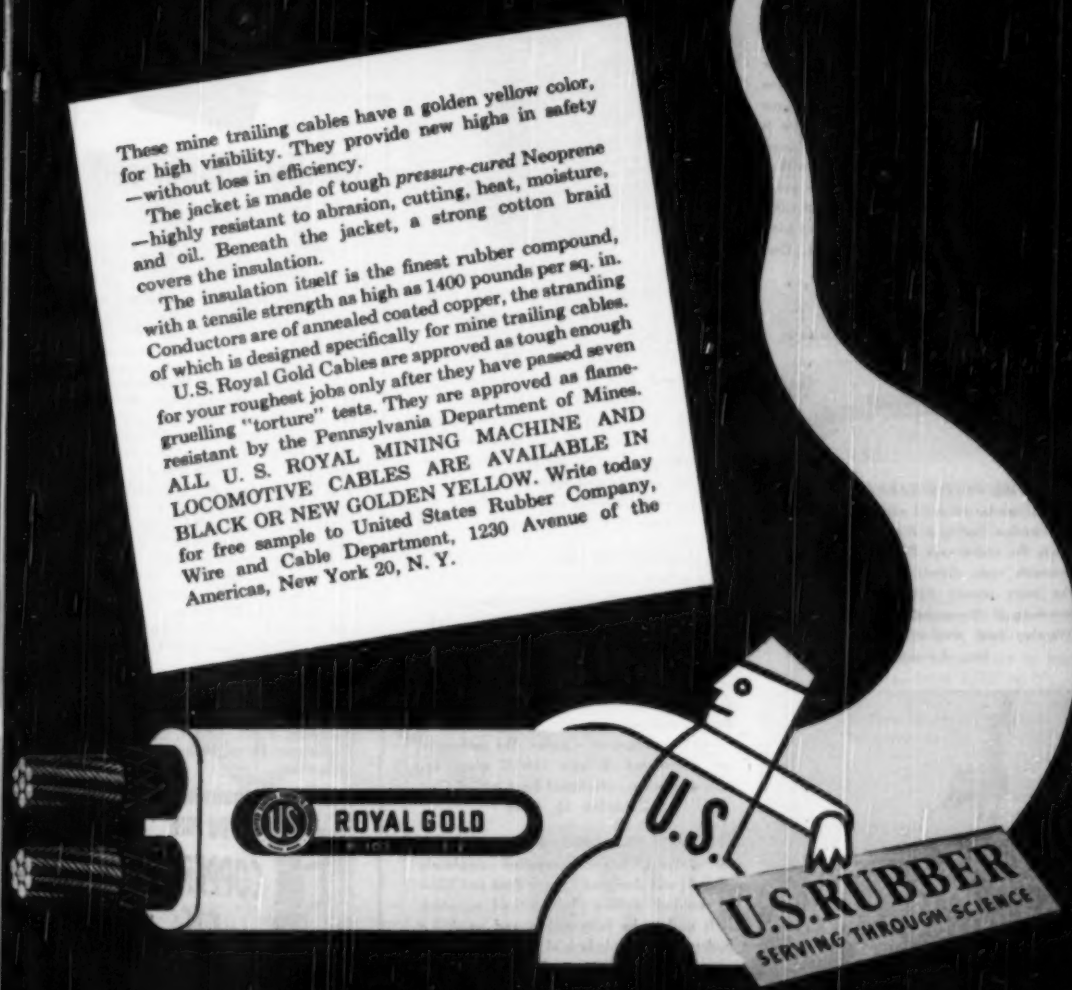
U.S. Royal Gold Cables

These mine trailing cables have a golden yellow color, for high visibility. They provide new highs in safety —without loss in efficiency.

The jacket is made of tough *pressure-cured* Neoprene —highly resistant to abrasion, cutting, heat, moisture, and oil. Beneath the jacket, a strong cotton braid covers the insulation.

The insulation itself is the finest rubber compound, with a tensile strength as high as 1400 pounds per sq. in. Conductors are of annealed coated copper, the stranding of which is designed specifically for mine trailing cables.

U.S. Royal Gold Cables are approved as tough enough for your roughest jobs only after they have passed seven gruelling "torture" tests. They are approved as flame-resistant by the Pennsylvania Department of Mines. ALL U. S. ROYAL MINING MACHINE AND LOCOMOTIVE CABLES ARE AVAILABLE IN BLACK OR NEW GOLDEN YELLOW. Write today for free sample to United States Rubber Company, Wire and Cable Department, 1230 Avenue of the Americas, New York 20, N. Y.

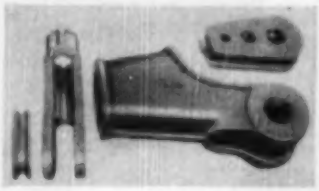


APPROVED AS FLAME-RESISTANT

BY THE PENNSYLVANIA DEPARTMENT OF MINES

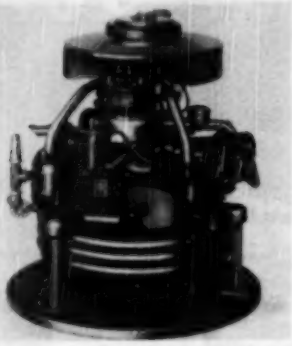
You'll Want to Know More About These

(15) SILVER PLATING your high-amperage electrical connectors on the job, to improve continuity of service, reduce maintenance and eliminate contacts overheating, now is no trick with Cool-Amp silver plating powder, the maker says. Simply applied with a cloth and water, Cool-Amp deposits a genuine coat of silver. A pound coats about 6,000 sq in. costs $11.50 prepaid. Folder and sample from Cool-Amp Co., Portland 1, Ore.



(16) WIRE ROPE BREAKAGE ON DRAGLINES can be reduced with new Baer socket and wedge that grip the rope in true-circle seats, the maker says. Design limits pinching, prevents rope distortion and cutting, and the rope cannot flatten or crush, rarely breaking at the socket, it is said. Made of Fibraloy cast steel.—Baer Steel Products, Inc., Auburn, Wash.

(17) ONE MAN EASILY HANDLES A 1,000-LB LOAD on any lifting, stretching or pulling job with the new "Mighty Midget" hand-operated hoist or puller, the manufacturer says. The unit weighs only 9½ lb, takes up only a foot of space and sells for $27.50. A smaller model, weighing 6½ lb, has a 500-lb capacity, lists at $19.75. Details available.—Coffing Hoist Co., Danville, Ill.



(18) READILY PORTABLE AIR COMPRESSOR, new 3R-36 "Spot-Air," developing 36 cfm at 80 psi, is said by Ingersoll-Rand to be the lightest, most compact gasoline-driven unit of its kind. It weighs only 265 lb and stands 32 in high on a 27-in-dia baseplate. The unit reportedly will handle a I-R J-10 Utility Jackhamer or many other small air tools for various construction and maintenance jobs. A special wheelbarrow mounting permits one man to move it almost anywhere. Bulletin available.—Ingersoll-Rand Co., New York 4.

(19) PINIONS ARE EASILY REMOVED by one man in 1 or 2 min with the new National induction pinion heater, and without damage to pinions or shaft resulting from application of high-tonnage pressure or overheating with a torch, the maker says. With its coil simply slipped over the pinion, the unit generates heat within the pinion, permitting removal with light pressure applied by either wedges or a puller. The surface is not overheated. Bulletin 13A162 gives details and prices.—National Electric Coil Co., Columbus 16, Ohio.

(20) ROOF-BOLT DRILL, the new Continental "Drillram," is a self-propelled completely electric unit designed to save time and labor in roof-bolt drilling. Rubber-tired mounted, it is said to be fully mobile and employ a hydraulic feed.—Industrial Div., Continental Gin Co., Birmingham, Ala.

DON'T STOP YET—You may be missing a good bet for lower cost and more efficient mine operation if you don't check over the other 45 items described on the following pages. The postage-free postcard facing p 124 will bring you more data if you'd like to have it.

To Control

Specify Copperized

CZC

(CHROMATED ZINC CHLORIDE)

The three common causes of wood failure are almost eliminated when you specify pressure treatment with Du Pont Copperized CZC. Because this salt-type wood preservative makes wood unappetizing to termites . . . kills decay-causing fungi . . . gives a high degree of fire retardance, too.

And Copperized CZC does all this without changing the characteristics of wood as a building material. The treatment leaves timber and lumber clean, odorless, paintable and safe to handle.

So, where wood is indicated and permanence demanded . . . be on the safe side . . . specify pressure treatment with Du Pont Copperized CZC.

Full technical details on Copperized CZC available for the asking. Write: E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Dept., Wilmington 98, Delaware.

DU PONT

REG. U.S. PAT. OFF.

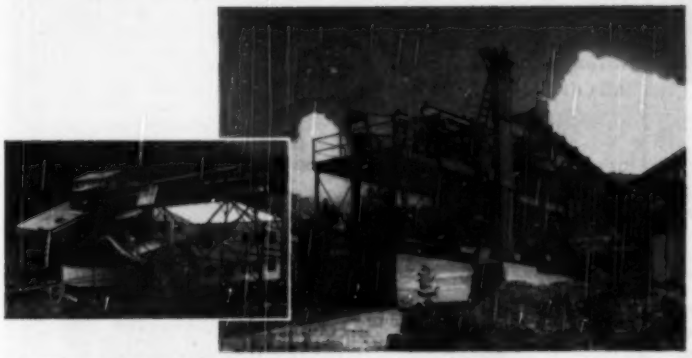
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

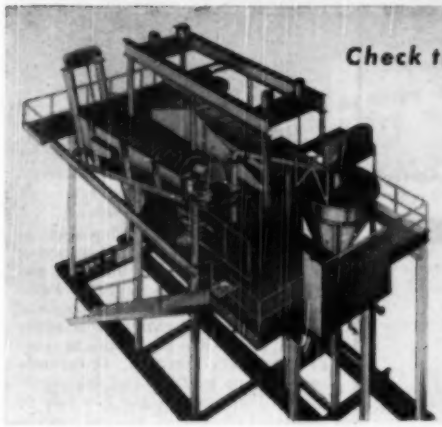
Clean Coal Sells!

More and more **cost conscious, profit conscious** operators are turning to WEMCO MOBIL-MILLS to meet today's competitive market. Clean coal of accurately controlled quality and grade assures a ready market at top prices.

GET CLEAN COAL WITH

WEMCO MOBIL-MILLS





Check these

MOBIL-MILL FEATURES

- ✓ **Prefabricated**
- ✓ **Low initial cost**
- ✓ **Low operating costs**
- ✓ **Clean, sharp separations**
- ✓ **Installed for you**

The WEMCO MOBIL-MILL gives you the flexibility of process, the accurate control and the cleaning efficiency necessary to produce clean, saleable coal of any desired grade. Employing the proven heavy media process, the Mobil-Mill offers outstanding advantages that mean greater profits in coal cleaning:

- Adaptability to any desired grade of product
- High coal recovery: recoveries from your refuse pile probably would buy a Mobil-Mill in less than one year
- Separations at any desired specific gravity from 1.25 to 2.50
- Control of separating gravity within ±.01 changeable in minutes or capable of being sustained for days

MOBIL-MILLS are available in several sizes to wash from 25 to 420 TPH, with cone or drum type separators to handle sizes from 3/32" to 8".

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CAN'T MISS!

AMERICAN COUPLERS WILL LOCK OR LOCK-SET ONLY WHEN TWO HEADS ARE TIGHT TOGETHER

SAFETY, SPEED, INFALLIBILITY! See how these modern *musts* have been engineered into American Mine Car Couplers. There's no risk of damage or delay. *Any* two heads will couple—and they're always *ready* to couple. Uncoupled heads *can't* be locked!

BUILT TO LAST. American's exclusive *nose-and-pocket* head design has many outstanding advantages. It protects the locking parts; has *extra-wide* gathering range. Locks engage with a tight grip; prevent slack and costly wear. Pull is transmitted through cast-steel contacts —*not* through the pivot pins. Sturdy full-length flanges take all buffing *without* side pressure.

RIGHT FOR YOU. American Couplers are self-centering, self-leveling; *won't "jackknife."* They unlock from either side without stepping between cars; rotary-dump without uncoupling. Made in swiveling and non-swiveling types and with attachments for locomotives. For faster, *safer* mine car movement, investigate the many money-saving features of these modern *all-service* couplers.

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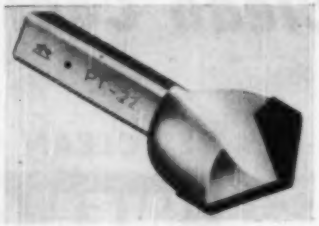
LOCKS HERE
LOCKS HERE
Won't Creep or Jar Open
As pivoted locks swing into engagement, each control bar drops to lock against the flange of opposite head.
LOCK-SET
Lifting and pulling either control bar unlocks the coupler and holds lock in lock-set position until heads move apart.

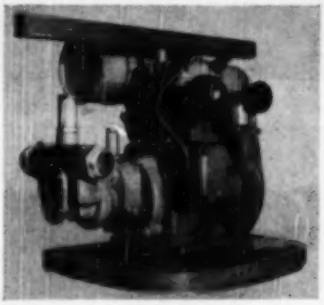
Safe...Sure AMERICAN MINE CAR COUPLERS

AMERICAN STEEL FOUNDRIES, 410 N. MICHIGAN AVE., CHICAGO 11, ILL.



Pin-Timbering Drill Bit (21)

Improved Carboloy carbide-tipped pin-timbering drill bit features maximum relief and clearance angles to eliminate dragging and assure free easy cutting; a deep spiral on the shank body that removes cuttings faster and minimizes wear on carbide surfaces; a strong braze of carbide tips; and maximum cutting-edge angles that reduce "plowing" and insure full use of cutting pressures. The bit is 4 in long and has a diameter of 1¾ in.—*Carboloy Co., Inc., Detroit 32, Mich.*



Portable Pump (22)

Built for various pumping applications, including fire fighting, spraying and jetting, cleaning earthmoving and other equipment, the improved Porto pump is a rotary positive-displacement rubber-gear unit that is easily moved, simple and dependable to operate, the maker reports. It develops pressures up to 200 lb and delivers 50 gpm at free flow. Nozzle flow may be restricted or shut off without stalling the engine and priming is unnecessary in practically all uses.—*Porto Pump, Inc., Detroit 7, Mich.*

Five Lubricant Pumps (23)

Three new Alemite models of an air-operated high-pressure lubricant pump, and two newly designed high-pressure electric Powerguns for use where air power is not available, feature several types of mountings for efficient lubricant handling. Delivering lubricant from 25-, 35- or 50-lb original containers, Model 711 pumps (above) have a new sealed-in air motor, which is unconditionally guaranteed for 27 mo, requires no oiling and cannot be stalled, the manufac-

Three "*dollars-and-cents*" reasons why you should build some cars with

U·S·S COR-TEN

COR-TEN CARS LAST LONGER

U·S·S Cor-Ten, in thicknesses commonly used for mine car construction, has a minimum yield point of 50,000 pounds per square inch—1½ times that of carbon steel. Its resistance to abrasion is greater. Its endurance limit is 60% higher. It has 4 to 6 times the resistance to atmospheric corrosion of plain steel. These superior properties pay big dividends . . . particularly in mines where corrosive conditions are severe, or where cars are exposed to the heavy duty of modern mechanized operations.

COR-TEN CARS REQUIRE LESS MAINTENANCE

Out-of-service time for major repairs is greatly reduced because of Cor-Ten's proved ability to stand up under conditions that shorten the life of ordinary, less rugged construction. It's a fact: More than five thousand Cor-Ten cars have been in use for over ten years, yet we have never heard of a single failure due to wear. A total of more than 26,000 mine cars has been built with U·S·S Cor-Ten.

COR-TEN CARS GIVE YOU LARGEST CAPACITY WITH LEAST WEIGHT

Authorities agree that big cars which permit full utilization of loading machine capacity—that reduce the number of trips necessary—and that save lubricants, repairs and man-power, are definite aids to greater efficiency and lower costs. For such cars, U·S·S Cor-Ten is the ideal material. Its superior strength and durability permit construction that offers maximum capacity and maximum ruggedness at a minimum of weight for any given over-all dimension.

U·S·S COR-TEN is a versatile steel. It is readily fabricated by all the usual shop methods and, in addition, lends itself well to whatever variations in design and dimensions are necessary to meet local operating conditions and users' preferences.

Write to our nearest office and get complete information on the important, money-saving advantages that COR-TEN offers the mining industry.

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Mine Roof

JACKS

Don't take chances! Be assured of maximum safety with Duff-Norton mine roof jacks as temporary supports, when installing split rods, expansion bolts and all other type suspension supports in your mine. For complete data on mine roof and other Duff-Norton Mine Jacks . . .

See your local distributor or write for the "Handy Guide for Selecting Duff-Norton Mine Jacks."

THE DUFF-NORTON MANUFACTURING CO.

MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA. — CANADIAN PLANT: TORONTO 6, ONT.

"The House that Jacks Built"

turer says. Model 711 is mounted on a castered base. Both Model 711A, mounted on a pivot-swing dolly, and 711B, a stationary unit, also can hold 70 lb of lubricant transferred from the original container. Model 7170B electric Powergun has a 25-lb capacity for light and medium lubricant, while the 40-lb-capacity Model 7175-R handles all types of grease. Mountings for both are available with either rubber or steel wheels.—*Alemite Div., Stewart-Warner Corp., Chicago* 14.

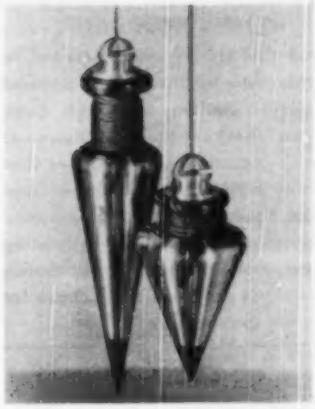
Pipe Couplings (24)

Morris compression-band pipe couplings, now available for pipes up to 8 in, permanently join either plain-end or threaded pipe, or a combination of the two. Standard zinc-coated or aluminum couplings are available in all sizes to maximum, with standard rubber-base gasket or special gaskets of cork, fiber glass or neoprene. Easily applied with a socket or crescent wrench, the company states, the coupling gives each joint the advantages of a union. Bulletin available.—*Morris Coupling & Clamp Co., Ellwood City, Pa.*

Equipment Shorts

(25) COLD-RUBBER BELTS—From 10 to 25% more wear in certain services requiring high resistance to abrasion is claimed for belts made of "cold" rubber by *B. F. Goodrich Co., Akron, Ohio.*

(26) PLUMB BOB—New No. 9 Mining Special MICRO bob, about 3 in high, was designed in cooperation with engineers in thin-seam fields, the maker says. In use, the cord is hung from



the point, quickly unreeled to approximate height, and then placed through the notch which centers the bob with the cord. Minute adjustment for height is then made by turning the reel. Sells for $6.—*Suverkrop Instruments, Box 436, Bakersfield, Calif.*

(26) WORK GLOVES—Jomac terrycloth gloves are heat- and flame-resistant, resist cutting better than woven cloth or leather gloves, provide positive grip on greasy or oily material, withstand repeated washings, will outwear canvas gloves up to seven times, and can be worn on either hand for longer service, the manufacturer claims. Bulletin available.—*C. Walker Jones Co., Philadelphia 38, Pa.*

(28) SAFETY TREAD — Hy-Tenso Safe Tread, made by bonding a fused aluminum-oxide abrasive on the surface of an alloy matrix at the time of casting, provides safe treads for stairways, gratings, machinery and car steps, running boards, and similar applications. The new material is inexpensive, unbreakable, corrosion-resistant and superior to steel or malleable iron in many respects, according to the maker.—*Safe Tread Co., New York 7.*

(29) VIBRATOR—Type F pneumatic vibrator for keeping materials flowing from bins has been simplified by changes in design so that the vibrator now consists of only five parts, according to the manufacturer. This simplification reduces maintenance, virtually eliminates wear and promotes easier operation, it is said.—*The Cleveland Vibrator Co., Cleveland, Ohio.*

(30) METALIZING MATERIAL—Sprabond wire, new self-bonding metalizing material, provides long-wearing bearing surfaces on precision parts of machine tools and in other applications where maintenance of close tolerances is necessary. Sprabond is extremely hard and is microscopically porous, thus holding lubricants which help to increase the life of bronze sleeve bearings. Bulletin 57B available.—*Metallizing Engi-*

Floating coal dust in your plant costs money! If you want to save that money, do as scores of high-profit coal preparation plants do—*make coal dust behave* with Pangborn Dust Control!

Efficient Pangborn Dust Contol gives you superior (and more profitable) reclamation. Machinery lasts longer, explosive hazards are reduced, working conditions improved because Pangborn *stops dust* from tipples, dry cleaning, dedusting and many other operations.

If you're now losing profits from faulty reclamation, high machinery maintenance or excessive dust conditions —call on Pangborn. A free *Dust Pocket Survey* costs you nothing, but may show how Pangborn Dust Control can earn profits for you!

GET THE FACTS! Write today for your free copy of Bulletin 909A. Just address: PANGBORN CORPORATION, 2800 Pangborn Blvd., Hagerstown, Maryland.

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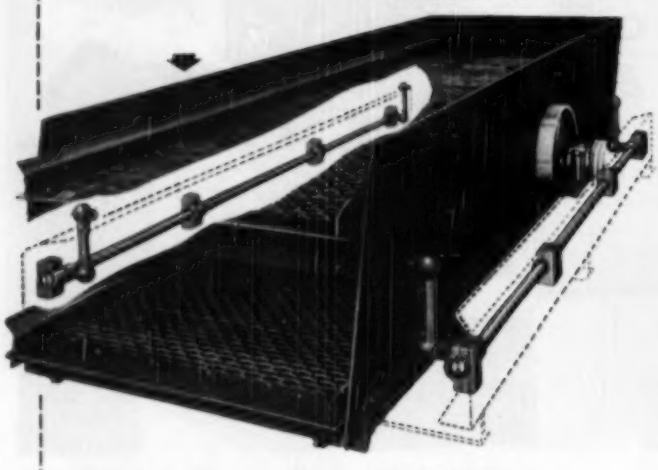
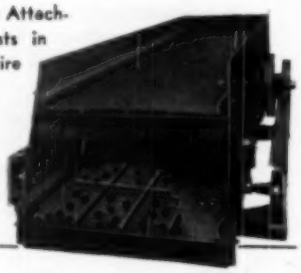


FULLY CONTROLLED TRUE CIRCULAR ACTION MAKES SECO *THE* OUTSTANDING SCREEN PERFORMER

From scalping lumps out of R.O.M. to complete sizing and dedusting Seco vibrating screens are delivering maximum tonnages for profit-minded coal mine operators. The smooth trouble-free performance of Seco vibrating screens is an established fact it will pay you to investigate in considering equipment for clean, properly sized coal—*at lowest cost per ton.*

ASSISTANCE IN SCREENING MOIST OR STICKY FINES

Pictured here is the Seco Ball Tray Attachment. Balls held in compartments in underside of deck bounce against wire cloth to help clear it of damp or sticky dust.



SINGLE, DOUBLE, TRIPLE & 3½ DECK MODELS

We invite you to have our screening experts recommend the right Seco Screens for your requirements. Send for Bulletin #11.

SCREEN EQUIPMENT CO., INC.

1732 Walden Ave. **Buffalo 21, New York**

In Canada, United Steel Corp., Ltd., Toronto, Ont.

65 NEW PRODUCTS . . .

OR CATALOGS are described in this month's New Equipment section starting on p 110. Have you checked through them—or are you missing a good bet that may help you jack output and cut operating costs? The handy postcard facing p 124 will bring you more dope on any of them—without obligation. It's there for your convenience.

neering Co., Inc., Long Island City 1, *N. Y.*

(31) **FIRE NOZZLE**—Type G-5 fire nozzle, which produces fine fog or straight stream with simple nozzle adjustment, operates on any pressure from 30 to 150 lb using approximately 8 gpm for fog and 10 gpm for straight stream. It has standard garden-hose threads. — *Bete Fog Nozzle, Inc., Greenfield, Mass.*

(32) **IMPACT TOOLS**—Lightweight impact wrenches, Impactools 504 and 510, are air-operated, pistol-grip units for running nuts up to ¾ in, drilling, reaming, tapping, driving screws, driving and removing studs, running wire brushes and similar duties. Automatic lubrication, built-in strainers and scientific muffling increase tool efficiency and reduce operator fatigue, it is claimed. Literature available.— *Ingersoll-Rand Co., New York.* 4.

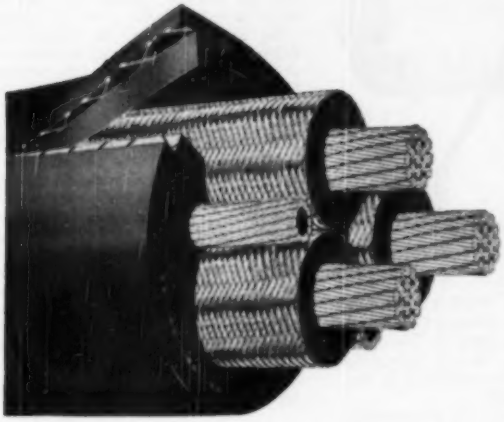
(33) **TRAINING COURSES**—Home-study courses in administration and leadership, designed for companies with no training programs of their own or to supplement company programs, for the purpose of filling the increasing demand for trained men to move up to more responsible jobs as industry mobilizes, are announced by *Holmes Institute,* 3324 *16th St., N. W., Washington, D. C.*

(34) **RESPIRATOR**—Recommended by the manufacturer for protection

It's Butyl-Insulated!

SECURITYFLEX type SHD

Better for your high-voltage, heavy-duty big shovel jobs!



The newly improved Securityflex* Type SHD is better because it's BUTYL-INSULATED for superior electrical and mechanical characteristics. It stands up better under compression and mechanical abuse, has increased moisture resistance and much higher heat resistance (rated at 80°C.).

Better because it has a new "copper-cotton" combination shield that

- **means faster, easier splicing**
- **eliminates chafing failures**

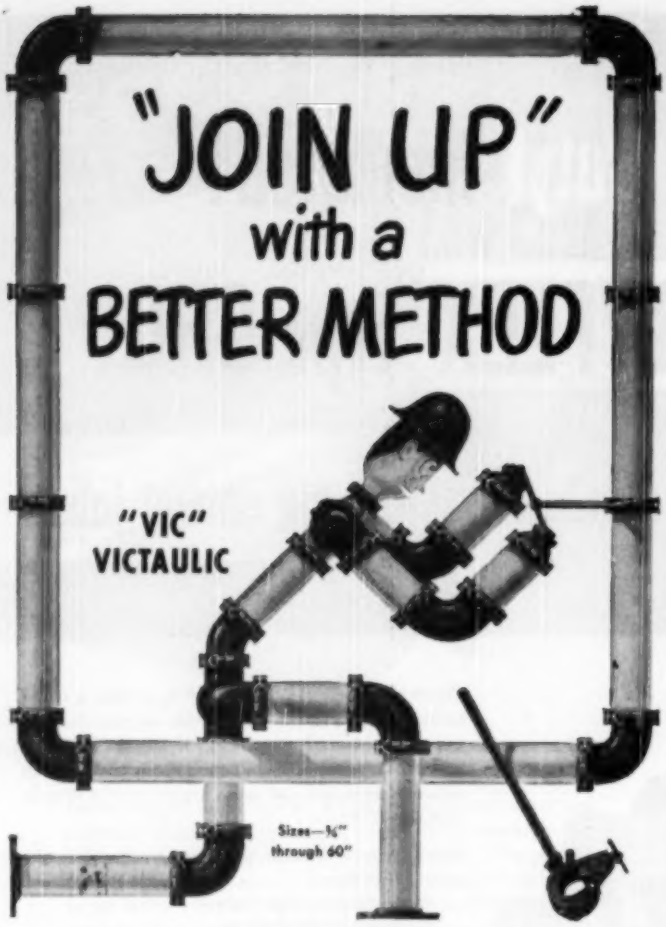
Better because the patented grounding wires are rubber-cored. That means grounding wires that

- **will not kink**
- **have larger diameter for greater contact with conductor shield**
- **provide cushioned construction that won't cut insulation**

It all adds up to a much more rugged shovel cable. For more information on Securityflex Type SHD, get in touch with your nearest Anaconda Sales Office or Anaconda Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

*Reg. U. S. Pat. Off.

the right cable for the job ANACONDA® WIRE AND CABLE



The VICTAULIC METHOD of piping can save you time, work, and dollars on construction and maintenance *right down the line.*

When you "join up" with the VICTAULIC METHOD you are assured of easy, quick, and dependable pipe connections. Pipe ends are "hooked up" in a jiffy with Victaulic couplings — only two bolts to tighten with a standard T-wrench! Victaulic pipe joints stay positive-locked, leak-proof ... they are built to stand up under extreme pressure, vacuum or strain conditions!

Grooving those pipe ends is a cinch with the VICTAULIC METHOD ... "Vic-Groover" grooves 'em automatically in half the time of a conventional pipe threader!

AND Victaulic offers a complete line of Full-Flow Elbows, Tees, and other Fittings designed for free-flowing efficiency ... giving complete versatility and dependability to the VICTAULIC METHOD.

"JOIN UP" with the COMPLETE VICTAULIC SYSTEM — a *better method* for efficient piping construction ... and the EASIEST WAY TO MAKE ENDS MEET. * * *

Make *your* next piping job ALL VICTAULIC. Write today for these two: Victaulic Catalog and Engineering Manual No. 44, "Vic-Groover" Catalog No. VG-47.

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26TH VICTAULIC YEAR

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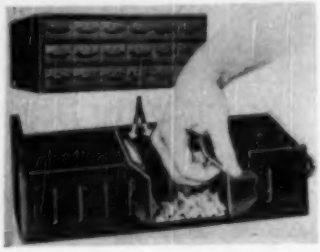
The easiest way to make ends meet
VICTAULIC
PIPE COUPLINGS AND FITTINGS

against chemical splashes, spray, impact of foreign particles and fine dust, combination goggle-respirator features a pliable, acid-resistant, synthetic-rubber frame; shatter-resistant replaceable acetate lenses; perforations to prevent fogging; and indirect ventilation, the maker states.—*American Optical Co., Southbridge, Mass.*

(35) CONTROL STATION—New 12-unit enclosure, Class 15-022 with Type OT pushbuttons, designed for machine-tool control and other heavy-duty applications, is available in control stations that feature flexibility, rugged construction and effective sealing against contaminants. Literature available. — *Westinghouse Electric Corp., Pittsburgh 30, Pa.*



(36) DRAWER DIVIDER—Equipto tilt-type drawer divider for use in small-parts cabinets provides easier safer handling of parts, better visibility of labels and easy adjustment of dividers, according to the maker. Catalog available.—*Equipto, Aurora, Ill.*

(37) TWO HEAVY-DUTY DRUM PUMPS added to the Lincoln Engineering line of lubricating equipment provide fast economical handling of lubricants, sealing compounds and other semi-fluid or viscous materials directly from 400-lb refinery drums where abnormally low air pressures are required. Both Model 1761 for bung-operated drums and 1766 for full-open drums can be installed to deliver through pipe lines to remote outlets. Bulletin 631 offers details. —*Lincoln Engineering Co., St. Louis 20, Mo.*

(38) ROLLER-CHAIN CONNECTING LINKS—A patented bushed center-plate connecting link developed for use with Diamond multiple-strand roller chain for severe service is said to combine high durability and wearing qualities with ease of connecting that simplifies handling of multiple-strand chain. The new connectors are available for ¾- through 2½-in-pitch Diamond roller chain. — *Diamond Chain Co., Indianapolis 7, Ind.*

(39) HEAVY-DUTY FLOODLIGHT, new Westinghouse Type CA-10 250-watt unit, is designed for applications requiring a sturdy light of low wattage that produces a relatively narrow beam spread. Its reflector is

open from 12-gage Alclad aluminum sheet and the lens is made of pressed heat-resisting glass, available in three types of glass.—*Westinghouse Electric Corp., Pittsburgh 30, Pa.*

(40) PNEUMATIC VIBRATORS—Series 81 vibrators, for intermittent or continuous operation on all storage bins or hoppers, can be used in conjunction with SPO quick-acting hopper-gate valve to operate the vibrator only when the gate is open, thus preventing compaction of material in the bin by premature vibration. Catalog 50 available.—*SPO, Inc., Cleveland 5, Ohio.*

(41) OILERS—Designed for solenoid- or manual-operation, Trico sight-feed oil reservoir lubricates from one to 20 bearing points on automatic machines, conveyors and so on. Individual lines may be independently regulated and locking arrangements prevents change of adjustment from vibration or tampering. Reservoirs are available in 1 pt and 1 and 2½-qt sizes.—*Trico Fuse Mfg. Co., Milwaukee 12, Wis.*

YES—I would like more information . . .

Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled. (Oct., 1950)

1	6	11	16	21	26	31	36	41	46	51	56	61
2	7	12	17	22	27	32	37	42	47	52	57	62
3	8	13	18	23	28	33	38	43	48	53	58	63
4	9	14	19	24	29	34	39	44	49	54	59	64
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In addition, please send me more data on these products advertised in this issue (give name and page number).....

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USE THIS CONVENIENT CARD . . . TO GET MORE INFORMATION on products and bulletins mentioned in this Equipment News Section or for data on any product advertised in this issue. Circle item numbers, tear out and mail.

EQUIPMENT BULLETINS—Use Postage-Free Card Above To Add These Helpful Catalogs to Your Working File

(42) MINING-CABLE MANUAL published by Hazard Insulated Wire Works Div., The Okonite Co., Wilkes-Barre, Pa., offers 72 p of descriptive and technical data, recommended applications and dimension data for every type of electrical wire and cable used in or about the mines. This Bulletin H-432 covers a full line of cables, including all types of flexible cords and portable cables, borehole and shaft cables, power-transmission cables, industrial wiring, shot-firing cord and other special constructions. A complete chapter is devoted to splicing methods, with illustrated step-by-step instructions for splicing every type of portable cable and standard power-transmission cable. Additional engineering data, application photos and drawings help make this booklet a comprehensive helpful manual for any cable user.

(43) MOTOR GRADER—New 20-p catalog from the Tractor Div., Allis-Chalmers Mfg. Co., Milwaukee 1, illustrates the versatility of the new A-C 54.7-hp. Model *D* grader on an assortment of construction and maintenance jobs, including bank sloping, ditch pulling, shoulder work, scarifying, road maintenance and several rear-end loader applications. Operating features, applications and specifications are thoroughly covered.

(44) CONVEYOR IDLERS—Information on troughing idlers and return idlers of improved design said to eliminate "high-speed rattle" and reduce maintenance costs is available in two new folders issued by The Conveyor Co., Los Angeles 58. Features of the new "snug" design and its application to permanently lubricated ball-bearing-type idlers and roller-bearing idlers are discussed.

(45) POST-MOUNTED AND HAND-HELD DRILLS available from the Jeffrey Mfg. Co., Columbus 16, Ohio, are thoroughly described and illustrated in new Bulletin 821 now available. Construction and operating details and specifications are covered, along with data on augers and drill bits, Jeffrey boom-type drills, self-propelled drilling machines and roof drilling machines.

(46) WORM-GEAR DRIVES of three basic types, each available in 10 different sizes, for fractional or large horsepower, and in speed ratios of 5¾ : 1 up to 3,000 : 1, are illustrated, described and tabulated in a new 20-p Book 2224 available from Link-Belt Co., Chicago 1. One section contains typical drive problems and their solutions and shows the ease with which the proper drive may be selected for a specific duty.

(47) AIR-LINE FILTERS—Protection of air-powered tools, gages and process equipment against air-borne impurities is covered in Bulletin 178 available from R. P. Adams Co., Inc., Buffalo 17, N. Y. The bulletin describes equipment for removal of water, oil and pipe scale from compressed-air systems, Adams after-coolers and cyclone separators and Adams Poro-Stone air filters and includes prices and dimensions, along with a table for determining loss of air-distribution efficiency from entrained water.

(48) LIQUID-LEVEL INDICATORS—Bulletin WG-1823 describes liquid level indicators and auxiliary attachments for remote indication of liquid levels in boilers, feed-water heaters, storage tanks, etc., including automatic control, signal lights, signal horns or electric switches. Bulletin contains complete constructions and operation details, installation suggestions, dimensions, etc., and is available from Yarnall-Waring Co., Philadelphia 18.

(49) MOTOR-SPEED CONTROL—Automatic Vari-Pitch drive, a simple, low-cost method of instant speed control covering most speed-changing needs from 1½ to 40 hp, is described in Bulletin 20B7225A, released by Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Motor speed is varied simply by moving the motor in relation to the driven sheave. The bulletin offers instructions and tables for figuring the components needed to assemble a drive for almost any speed and horsepower within its range.

(50) WIRE ROPE—Bulletin 50-25 from Macwhyte Co., Kenosha, Wis., condenses and combines information on Macwhyte improved plow-steel wire ropes to offer all sizes and construction classifications in one large table to facilitate specifying. Suggestions for ordering wire rope also are included.

(*Continued on reverse side*)

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EQUIPMENT BULLETINS AVAILABLE—Con't.

(51) "HOW TO SIMPLIFY YOUR FILES AND FILING SYSTEMS," a new 40-p booklet released by Remington Rand, Inc., New York 10, starts from the premise that many time-saving, work-saving filing techniques are often unknown to the average file clerk. Booklet LBV206 emphasizes the simplicity and convenience of accurate filing conducted with adequate filing systems, outlines scientific filing methods, details indexing features of a good filing system and discusses the various ways and means of finding filed material.

(52) HAND-HELD ROCK DRILLS—Bulletin H-1200-B38, issued by Worthington Pump & Machinery Corp., Harrison, N. J., covers operating and design features and specifications for the WS-45 and WS-55 drills with cylinder bores of 2¾ in; and WS-80 unit with a 3-in bore.

(53) SHOCK AND VIBRATION MOUNTS for protection of industrial and mobile equipment ranging from heavy machinery to sensitive instruments are listed and described in Catalog 504, Barry Corp., Cambridge 39, Mass. "Barrymounts" in a wide range of load and deflection ratings for diverse types of equipment are tabulated for rapid selection, with details of mounting methods and application principles.

(54) ASBESTOS-COMPOUNDED PIPE—Bulletin AB2250 on Armco Asbestos-Bonded pipe describes and illustrates installation, structural-strength and material-durability features, and details of manufacture of this pipe designed for severe-service conditions. Available from Armco Drainage & Metal Products, Inc., Middletown, Ohio.

(55) WELDING CONNECTORS—Bulletin SM-1 describes a new line of Joy welding connectors, said to engage easily, yet cannot be accidentally disengaged. Molded as a unit of neoprene, and vulcanized to the cable, they are shatter-proof, jerk-resistant and water-tight. The bulletin, available from Mines Equipment Div., Joy Mfg. Co., Pittsburgh 22, Pa., also describes String-a-lite portable lighting fixes.

(56) RUBBER PUTTY — Catalog Section 9765, describing use of Plastikon rubber putty, recommended for many types of glazing and sealing and particularly suitable where vibration, corrosion or moisture exists, is available from B. F. Goodrich Co., Akron, Ohio. It can be applied with a caulking gun, bulb applicator or putty knife.

(57) NEW SELF-PRIMING CENTRIFUGAL-PUMP LINE is described in detail in Bulletin 636.1, Goulds Pumps, Inc., Seneca Falls, N. Y. Featuring a new design that eliminates valves and yet gives efficiency comparable to standard centrifugal pumps, the units range from ¾ to 5 hp, with capacities to 120 gpm and heads to 185 ft.

(58) MOTOR COUPLINGS—Bulletin WC1 describing design, operation and application of Dynamatic Water-Cooled Couplings for adjustable-speed ac drives is available from Dynamatic Corp., Kenosha, Wis. The booklet offers detailed information on basic principles, characteristics, operating efficiencies and control.

(59) FINANCING ON INVENTORY—Booklet, "Borrowing on Inventory to Finance Your Business," outlines the Lawrence field warehouse plan, by which business firms in various industries can borrow on their own inventory stocks to secure increased working capital, purchase additional equipment, take discounts, etc. Available from Lawrence Warehouse Co., New York 5.

(60) STEEL DERRICKS—Its complete line of steel derricks is described in a new 36-p Catalog 200-D-3 issued by American Hoist & Derrick Co., St. Paul 1, Minn. Complete specifications, outline drawings, full-page operating pictures and construction details are included on the six different types, and, to assist users, one page is devoted to the correct method of determining boom length for lifting a required load to a pre-determined height at a given radius.

(61) BUSINESS CONTROLS—Covering the efficient maintenance of business records and effective administrative control over all phases of business management, a new 80-p catalog, "Kardex Visible Record Control," describes various combinations of record forms usable with Kardex "pockets," colored signal-control methods, new computing charts and other equipment designed for sales, financial, inventory and other controls. Catalog KD462 is available from the Management Controls Div., Remington Rand, Inc., New York 10.

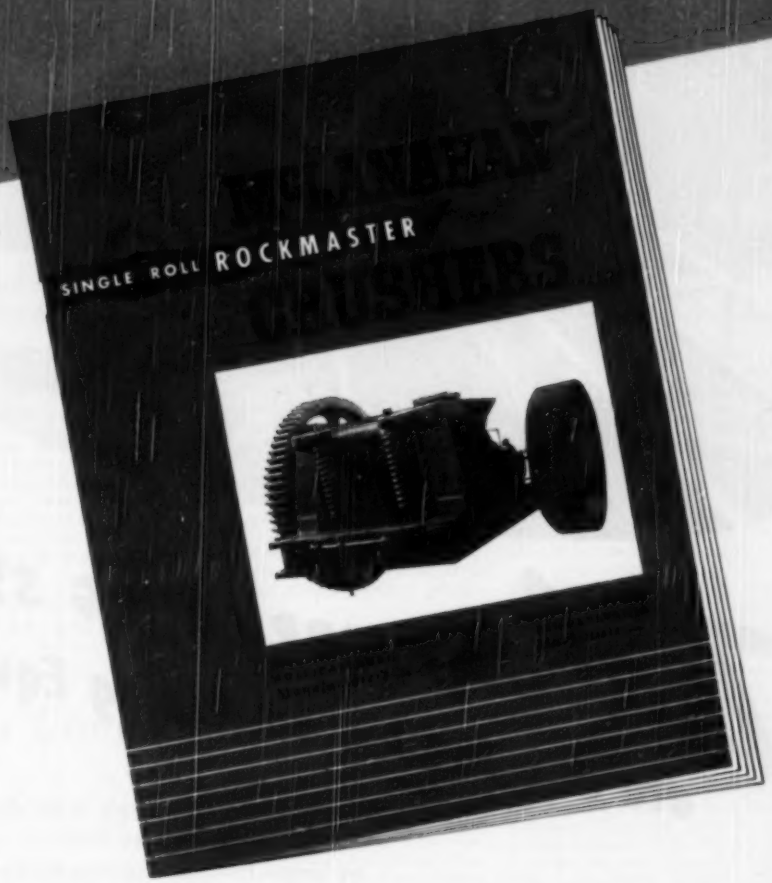
(62) RESEARCH AND TESTING FACILITIES of the Allis-Chalmers Basic Industries Research Laboratory are graphically described and illustrated in Bulletin 07B6419A, issued by A-C Mfg. Co., Milwaukee 1, Wis. The laboratory is a service organization available for investigating processing problems that develop in the beneficiation of raw materials produced in basic industries.

(63) PIPE TOOLS—Folder from Beaver Pipe Tools, Inc., Warren, Ohio, describes operation and features of the Beaver 102-PD (power-drive) pipe cutter and the Beaver No. 77 threader, a quick-opening, adjustable ⅛- to 2-in pipe threader.

(64) "CHEMICALS FROM COAL" is a 44-p booklet detailing the physical and chemical properties of 58 commodity and specialty chemicals recovered in the coking of coal or derived from the distillation of coal tar by Koppers Co., Inc. The booklet, No. 705-500, is available from Koppers Tar Products Div., Pittsburgh 19, Pa.

(65) RODS AND ELECTRODES—Bulletin from Sight Feed Generator Co., Alexandria, Ohio, describes various rods and electrodes and lists many hard-surfacing applications, with recommended rods for each, along with technical data on running of hard-facing electrodes and hints on manganese welding.

MODERNIZING YOUR OPERATIONS?



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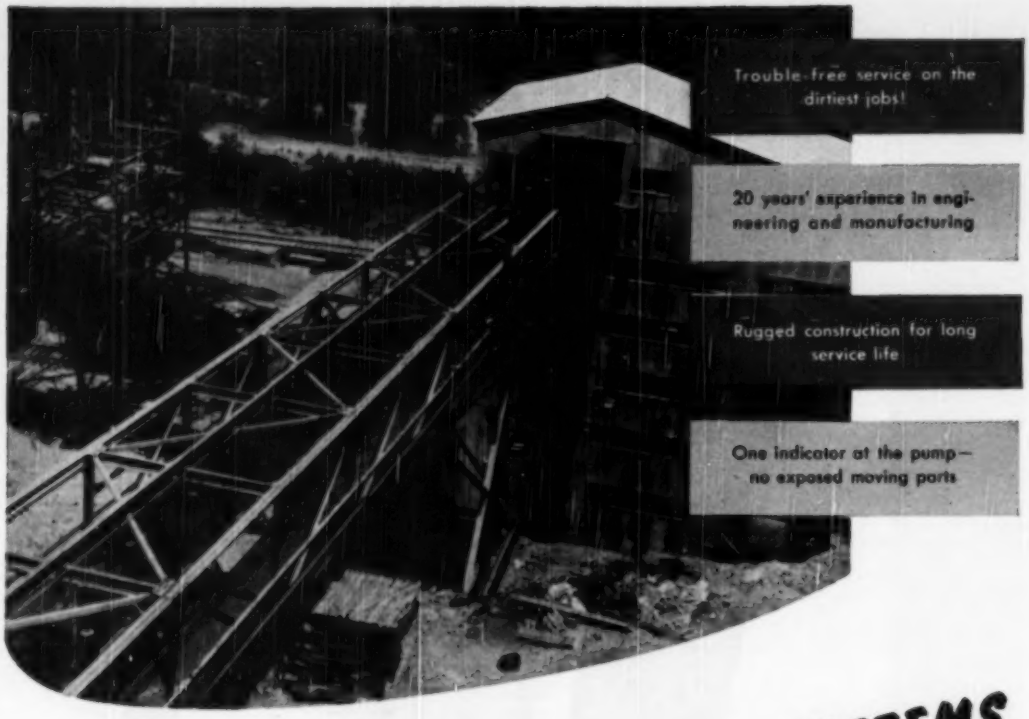
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What the 1950 Defense Act Provides

President Gets Economic Power Over Nation Similar to That of World War II—Act Includes Power to Channel Materials and Plants Into Essential Production, Expand Productive Capacity, and Control Prices, Wages and Consumer Credit

THIS DIGEST prepared by *Coal Age's* Washington office outlines the major power granted the President under the Defense Production Act of 1950, as passed by Congress Sept. 1. The price, wage and credit controls are scheduled to expire June 30, 1951. Other controls put on before June 30 would remain in effect until June 30, 1952.

Title I—Priorities and Allocations

Producers can be ordered to accept defense contracts and to put them ahead of all other business. In other words, President Truman can force conversion to military production if there is any balking on defense orders.

All materials can be controlled. Defense and essential civilian needs will be given a first claim on materials and facilities. The President can not only order cutbacks in non-military production, but he can if need be, force a shutdown of non-essential production.

Under allocations provisions, he can install consumer rationing.

Inventories can be limited. This power will be used to prevent hoarding or excessive stocking.

Penalties for violations under Title 1: Fines up to $10,000 and prison sentences up to 1 yr.

Title II—Requisitioning

The President can requisition any materials, parts and equipment needed for manufacturing, servicing or operating defense needs. But first he must make a finding that the items are necessary for defense, that the need for them is immediate and that other means of obtaining them have been exhausted.

Just compensation must be paid for requisitioned items. If the owner and the government can't agree on the price, the owner will get 75% of the government's offering price and then can sue for what he considers just.

Original owners are to have first chance at buying back requisitioned

Your Community Chest

WE BELIEVE in the "many-in-one" campaign idea.

This year, Community Chests are uniting more than 15,000 health and welfare agencies in one big effort to raise approximately $190,000,000. This is to help finance such typical Red Feather services as Boy Scouts and Girl Scouts, Maternity Homes, and Visiting Nurses, Family Service, Travelers Aid, Neighborhood Houses and Legal Aid. Included too are Boys' Clubs and Camp Fire Girls, Urban League, Children's Aid, Hospitals and Clinics, and Services for the Aged. The Salvation Army, Y.M.C.A., Y.W.C.A., Summer Camps, Clubs for Girls, Aid to the Handicapped and Social Hygiene services also are members of the Red Feather family.

Being businessmen, we see the advantage of uniting these many campaigns under one efficient, fund-raising organization. Industry *knows* that production costs drop as volume increases. Over 30 years' Chest experience *proves* that coordinated campaigns cost less, save time and energy and raise more money to provide more and better services. Big or small, federated campaigns guarantee effective use of the funds subscribed. They substitute order for the chaos that comes with many separate fund-raising efforts.

Proof that the "many-in-one campaign" is effective lies in the fact that appeals are being federated in more and more local communities. Leaders of both management and labor, in civic clubs and governmental departments, from professional circles and educational groups, are giving increasing endorsement to the idea of joint campaigning and budgeting.

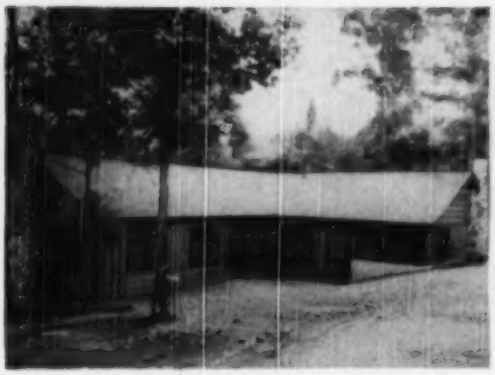
The number of communities organizing Chests has steadily increased. In 1940 there were 561 reported Chests. By 1948 the number had grown to 1,060. At the present time, definite information is available about Chests in more than 1,250 cities.

Federated drives raise more money for the participating agencies than they raise separately. No city has ever reported that it raised *less* money for its needed services in a federated campaign than the agencies secured independently in separate appeals. On the contrary, seven cities holding their first Community Chest campaigns last year, actually raised an average of 87.3% more than the health and welfare agencies had raised in previous years by individual efforts. This successful 1949 experience with first Community Chest campaigns has been duplicated in hundreds of communities over the 37-yr history of Community Chests.

United campaigns are wisely planned, cooperative undertakings. We believe they make sense and should be supported generously by all thoughtful businessmen.

Charles E. Wilson, National Campaign Chairman, Community Chests of America
(President, General Electric Co.)

Charles E. Wilson, Vice-Chairman, Community Chests of America
(President, General Motors Corp.)



SCOUT CAMP DINING HALL donated by the Jewell Ridge Coal Corp. at a cost of $10,000 has full equipment and seating capacity for 200 boys. Among the guests attending a dinner for Jewell Ridge officials held in the new hall during the summer were: Roland C. Luther (left), vice president, Peerless Coal & Coke Co.; George Richardson Jr. and G. H. Lawhead, Jewell Ridge directors; Milt Gilmore, personnel director; James Hagy, superintendent; C. M. Brown, recreational director; and Dr. Huston St. Clair, president, Jewell Ridge Coal Corp.; and J. C. Acuff, area scout executive.

W. Va. Coal Firm Donates Boy Scout Hall

A new $10,000 dining hall with full equipment and seating capacity for 200 recently was turned over to Boy Scout officials at Camp Roland, Bland County, Va. Jewell Ridge Coal Corp., Tazewell, Va., is the donor.

The new building, completed early in July, is an addition to facilities previously installed at the Boy Scout camp. Scouts from the Southern West Virginia Area Council, which includes Mercer, McDowell and Monroe Counties in West Virginia and Giles, Bland and Tazewell Counties in Virginia, will benefit from the new structure.

The 100-acre site for the camp was donated by Mr. and Mrs. Laurence E. Tierney Jr., of Bluefield, and the dining hall provided by Jewell Ridge was the largest of the structures needed for development of the property. Mr. Tierney, president of the Eastern Coal Corp., is president of the Scout Council. Other coal men serving as officials of the council included George Richardson Jr., Roland Luther, Lewis C. Tierney and E. C. Luther.

The T-shaped building is 90x30 ft. Flooring is concrete and a native-stone fireplace is built in the main hall. Ample kitchen and storage space is provided, as well as hot and cold running water.

Formal dedication ceremonies will be held at a later date. A bronze plaque to the memory of George W. St. Clair, founder of Jewell Ridge Coal Corp., will be placed in the building.

Directors and officials of the Jewell Ridge Coal Corp. were guests at a dinner held in the new dining hall during the summer. Those attending included Dr. Huston St. Clair, president; George Richardson Jr. and Guy H. Lawhend, directors; James Hagy, superintendent; M. Gilmore, personnel director; and C. M. Brown, recreational director, shown above in the main hall.

1950 DEFENSE ACT—Cont'd

property once the government no longer needs it. In instances where the repurchase price cannot be negotiated on a satisfactory basis, arbitration will be used.

Title III—Expansion of Productive Capacity and Supply

The methods for boosting production are:

1. The government, through the Federal Reserve System, will guarantee loans to expand output. This will apply to facilities necessary to defense and to the development of new sources for essential minerals. This will work on much the same basis as the V-loans of World War II.

2. Long-term purchase contracts can be made by the government for metals, minerals, liquid fuels and other defense-needed items. The chief purpose is to stimulate marginal production and development of new sources. The government may buy at above the market price—pay a subsidy, in other words.

The government can make direct loans to expand production. There is full power to set up a new agency to run the program, if Mr. Truman wishes. Or it can be handled through the Reconstruction Finance Corp. or other agency which the President may designate.

Up to $2-billion is authorized for the expansion program. The Treasury can be called on to make $600-million immediately available. An additional $1.4-billion is authorized to be appropriated by Congress later.

Title IV—Price and Wage Stabilization

Wage and price control can be attempted on a voluntary basis. The President is given authority to seek industry-labor agreements to hold the line, so to speak, on prices and wages. And he can suspend the anti-trust laws to make such agreements possible.

But the President also has authority to order price and wage ceilings, on a selective basis or blanketing everything. He would have only to find that voluntary stabilization would not be adequate and that prices have either risen or threaten to rise unreasonably above the May 24-June 24, 1950, level.

Price ceilings and wage ceilings are

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No haul too tough . . . no coal too rough for Quaker Conveyor Belts. That's why they are used in the leading mines throughout the nation. Belts that assure minimum of maintenance and low cost conveyor operation.

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Quaker Transmission Belting is pre-tested for maximum horsepower transmission. Available for all types of drives—from fractional horsepower to the largest installations.

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There's a Quaker Hose for every use in the coal industry—from the air hose on the lowest level to the water hose in the washer.

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Quaker's Mine Trolley Cable Guard offers protection for mine cables. It is specially compounded of synthetic rubber to resist mine damp, acid and water. It is also resistant to fire which adds an extra safety margin and prevents breakdown.

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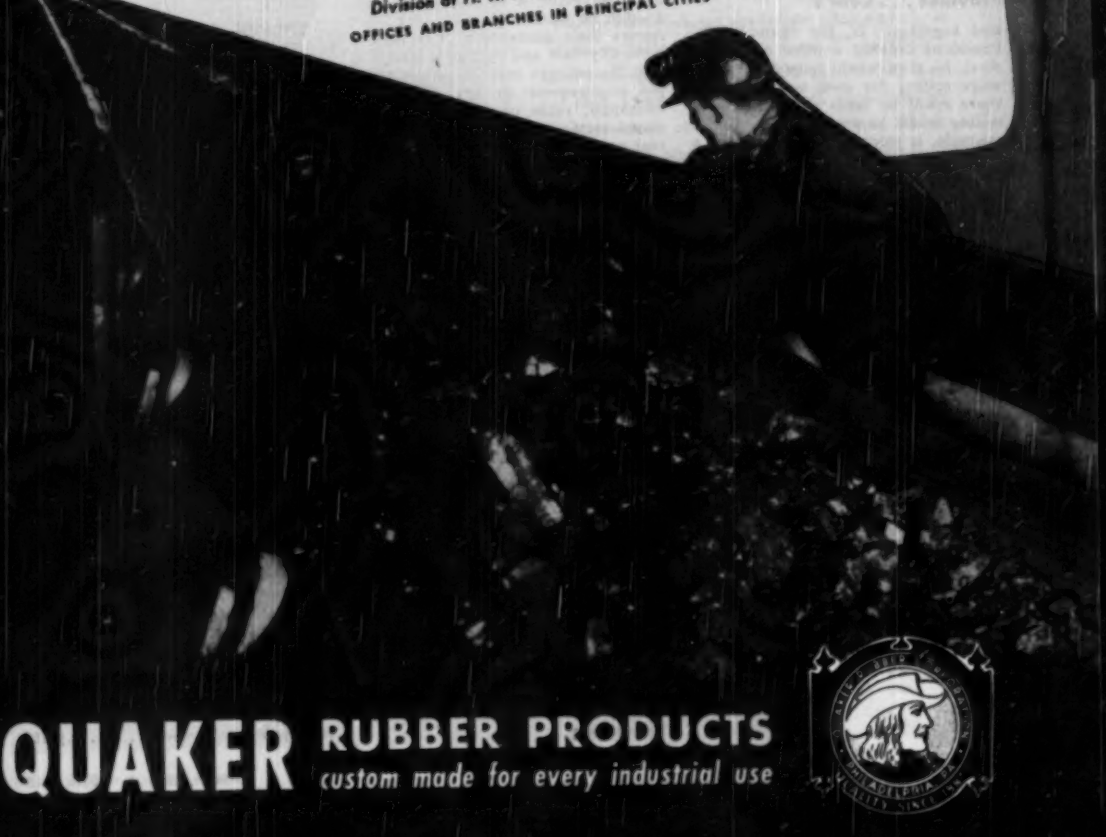

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Bituminous Coal Operators Form New Association

Formal announcement of the organization of the long-discussed Bituminous Coal Operators' Association was made Sept. 21 by George H. Love, acting president, who reported the election of a board of directors and the election of a president and secretary-treasurer at a board meeting held in New York that day. As organized, the group represents 153,000,000 tons of bituminous coal production.

Harry M. Moses, for the last 13 yr president of the H. C. Frick Coke Co. and associated companies, was unanimously elected president. Joseph G. Chromis, associated with Mr. Moses for the past 25 yr as his personal secretary and administrative assistant, was elected secretary-treasurer.

The board of directors, consisting of the chief executives of member companies, are: Charles B. Baton, L. C. Campbell, E. L. Clair, W. H. Colvin Jr., Charles Dorrance, Charles E. Dunlap, Benjamin F. Fairless, William W. Holloway, Arthur B. Homer, R. L. Ireland, Thomas B. Jamison Jr., R. H. Knode, E. B. Leisenring, George H. Love, A. R. Matthews, J. L. Mauthe, Admiral Ben Moreell, C. J. Potter, Clarence B. Randall, J. P. Routh, H. G. Schmidt, W. P. Tams Jr., J. William Wetter and Charles M. White.

The organization was activated Oct. 1, when Mr. Moses resigned from Frick and assumed his new duties. Headquarters will be established in the World Center Bldg., 16th and K Sts. N. W., Washington, D. C., as soon as the building is ready for occupancy, on or about Nov. 1.

The purpose of the new association, according to the announcement, "is to conduct the contract negotiations between the member companies and the representatives of their employees and to generally promote stable and harmonious relations in this field."

What the 1950 DEFENSE ACT Provides . . . Cont'd

tied together. If, for example, the President ordered a price ceiling on steel, he then would have to order a wage ceiling for steel workers. But there could be cases when the wage ceiling would be meaningless. If, for example, a price ceiling is put on a single item produced by the chemical industry, say, a wage ceiling would have to be placed on all chemical workers. However, if the President found that rising wages in the chemical industry would not push up the price of the single item on which a price ceiling had been imposed, he could let the wages go on up.

The President can rely on existing agencies to administer price and wage ceilings until such time as these controls substantially cover the whole economy. Then he must set up a separate agency to run the whole show.

Price ceilings may be appealed within 6 mo after they are imposed, first to a review board, then to the Emergency Court of Appeals and then to the Supreme Court.

Here are the major limitations on the President's price and wage control powers:

1. Price and wage ceilings may not be set below the May 24-June 24 level —or a representative period nearest those dates where the May 24-June 24 level was abnormal.

2. Farm-price ceilings may not be set below the parity price or the highest price received by farmers in the base period.

3. Processors of farm commodities must be given a ceiling price high enough to permit them to pay producers their guaranteed price plus a generally fair and equitable profit.

4. No ceilings may be set on margin requirement on any commodity exchange; rates or fees for professional services; prices or rentals of real property; rates charged by public utilities or common carriers; insurance rates; prices of newspapers, periodical books, motion pictures and other communications.

5. Specifically prohibited is elimination or restriction of brand or trade names and grade labelling of any materials or products. Standardization of any materials is prohibited unless the President determines that such standardization is the only practical method for securing effective price controls. Specifications and standards must conform with those in general use in the trade.

6. No price-control order may force a retailer to limit sale of his highest-price line.

7. Consideration must be given, in establishing a ceiling price, to sellers who have contracts in effect for future delivery of materials processed from raw materials in which seasonal demands or normal business methods require contracts for future delivery.

The President does have authority to exempt any material from ceilings, or to lift ceilings, if he finds such exemptions will stimulate production for the national defense, or if such ceilings aren't necessary to stabilize the economy.

Title V—Settlement of Labor Disputes

The President is given no power to order settlement of labor-management disputes. The legislation stipulates that disputes policy is to rely on voluntary action—negotiation and conciliation—to prevent strikes. The President can, however, call labor-management conferences, or set up disputes handling machinery along the lines of the old War Labor Board.

It is specified that nothing shall be done which is contrary to either the Fair Labor Standards Act (minimum wages, maximum hours) or the Taft-Hartley Act.

Title VI—Control of Consumer and Real-Estate Credit

The Federal Reserve Board is given full power to regulate installment credit. It will specify the cash to be paid down and the length of the installment period for retail sales of such things as autos, home appliances, furniture, etc. This is the old "Regulation" power.

Control of real-estate credit hinges largely on power given the President to raise cash down payments and shorten amortization periods on housing financed by government insured mortgages. It has been the government's terms and not those of private lenders that have produced the housing inflation.

Title VII—General Provisions

Business advisory committees: These are authorized to be set up to consult with the government on operation of any of the control programs.

Small business: The legislation specifies that it is to be given favored treatment in all possible ways. But this actually amounts to no more than a declaration of policy.

Anti-trust laws: The government can grant exemptions when necessary to help the defense program along. For example, manufacturers could work out an agreement with the government on what percentage of their production is to go to normal uses and what percentage to defense.

Watchdog committees: A group of 10 members of the House and Senate banking committees (five from each) will ride herd on how the powers are used.

You'll Want to Read . . .

NEW LOADING RECORD OF 1,482 tons per shift set by Illinois crew.....p 154

FRICK PLANS new 4,000-tpd mine and reopens another of same capacity . . . and other new mine developments.....p 172

JOHN L. LEWIS outlines UMWA objectives in Labor Day speech. Also tells operators to keep Taft out of Ohio mines.....p 178

32 CRITICAL MATERIALS the first to be put under government controls.....p 184

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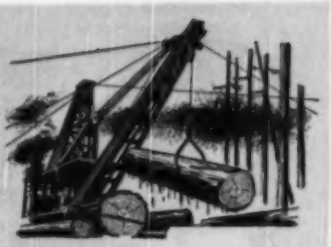

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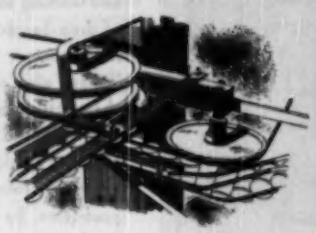

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Families See New Portal at Mine "Open House"

EMPLOYEES AND THEIR FAMILIES at the "Open House" marking the opening of the new Dorseyville portal of the Harmar mine, Consumers Mining Co., Hamarville, Pa., enter the new portal building (left) and enjoy refreshments provided by the company in the washhouse (right). Some 3,000 visitors toured the property and for most of the wives and children it was their first opportunity to go underground and see the modern machinery and methods in use.

"We have received many interesting and complimentary comments on the 'open house' and as far as we know it was the first such occasion of its kind ever held in a coal mine," the company reports. "All in all, we feel it was a tremendous success and we are well pleased with the results obtained," a company official says. Success for the program is credited to G. C. Trevorrow, general superintendent of the Harmar mine, who originated the idea and made the arrangements for handling the crowd.

In addition to publicizing the event by bulletin-board notices and word of mouth, the company sent a postcard invitation to the home of each employee. Each visitor received an attractively printed folder, which, as well as being a tribute to the coal miner, emphasized the importance of steel made with coal from the mine in present-day community and national life. The company is a subsidiary of the Wheeling Steel Corp.

EVAN EVANS, president, Lehigh Navigation Coal Co., was one of the many management officials on hand to help serve dinner at the company's 8th annual outing for its "Old Timers." With 50 yr of service the only requirement, the "Club" now has a membership of 279 men.

Lehigh Navigation Honors Veteran Employees

The annual shindig of what the Lehigh Navigation Coal Co. calls "The Most Exclusive Club in the World" proved again this year that Lehigh Navigation mine workers in Eastern Pennsylvania's Panther Valley are some of the longest-lived people in the world. Membership of the "Old Timers Club," where the only requirement for admission is that a man must have worked a minimum of 50 yr for the company, now totals 279.

There were 26 "freshmen" admitted when the 8th annual outing was held Aug. 5 at Greenwood Lake, near Lansford, Pa. President Evan Evans, of Lehigh Navigation and other officials were on hand to act as hosts for the company.

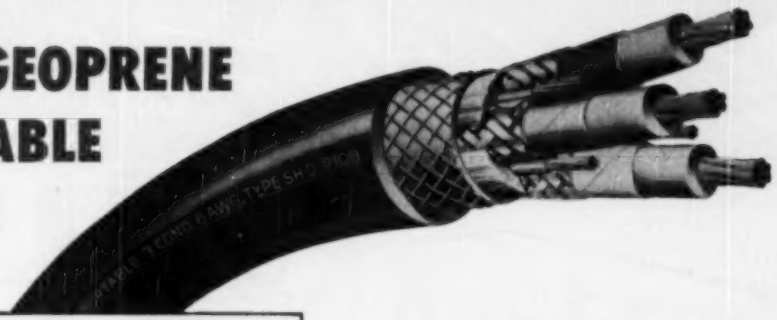
Naturally, the Old Timers of today began work in the mines at very early ages, many of them before they even reached their teens. Today, the sons of Panther Valley finish high school, and many of them go on to college, and unlike their fathers, they take up work in the business of mining only after they've acquired a solid education and mature years.

There was plenty to eat as the oldsters tucked away a hot turkey platter and then put in a full afternoon at the food stand, where they had all the clams, corn-on-the-cob, cold cuts and hot "vittles" they could hold. When it came time to sit down to dinner, President Evans and others of the company's management group put on aprons and acted as waiters, which delighted the Old Timers no end. The Coaldale Victory Band provided springy music during the proceedings.

"Anthracite will be around for a long time," said "Pat" Malloy, as he accepted from President Evans a membership pin on behalf of the newcomers to the Club. His words were echoed by 79-yr-old Harry Shires, of Summit Hill, who is the champion Old Timer, with a remarkable service record of 69 yr on the Lehigh Navigation payroll. Mr. Shires retired in 1949.

HERE'S EXTRA STRENGTH... EXTRA TOUGHNESS

GEOPRENE PORTABLE CABLE



Compare—

and be convinced!

These figures, comparing ASTM requirements with typical G-E Geoprene values, indicate at once the superiority of portable cable with Geoprene sheath:

ORIGINAL	ASTM REQUIREMENTS	GEOPRENE TYPICAL VALUES
Tensile strength, lb/sq in.	1800	3000
Per cent elongation	300	500
Set in 2-in. test piece, in.	3/8	1/16
After 7 days in Geer oven at 70C		
Tensile strength, lb/sq in.	1600	2900
Per cent elongation	250	430
After 96 hrs. in oxygen bomb at 70C		
Tensile strength, lb/sq in.	1600	2800
Per cent elongation	250	430
After 18 hrs. in oil at 121 C		
Per cent depreciation in tensile strength	40	35
Per cent depreciation in elongation	40	35
Tear Test		
Tensile strength, min. lb/in.	40*	75

*This is the requirement for rubber jackets; no tear value has yet been set for neoprene-type jackets.

Look to G-E wire and cable for continuing progress toward
Investigate these famous G-E cables for big returns in mining operations.
Mine power cable insulated with Super Coronal* . . . Versatol*-Geoprene portable cable . . . Bore hole cable . . . Varnished cambric cable . . . Locomotive cable . . . Flamenol* mine telephone cable . . . Shot firing cord . . . Deltabesten* power cable and magnet wire.
*Registered Trade Mark of General Electric Company

A portable cable whose jacket has much higher tensile strength than required by ASTM standards . . . more than twice the tear resistance of older-type jackets—that's General Electric Geoprene portable cable!

Give G-E Geoprene cable the hardest possible service—bury it under rock falls, maul it with heavy equipment, drag it behind mining machines, wind it off and on reels repeatedly—it's made to outlast cable made with natural rubber. And, at the same time, you'll get sizeable savings in replacement costs over types of cable that won't stand up under rough treatment.

Tough, cable-laid twine under the outer Geoprene sheath gives G-E portable cable additional strength. An inner jacket cushions conductors against hard knocks and operating abuses. And because high-voltage Geoprene portable cable is built to permit continued operation at 75 C, you can use sizes that are smaller, less bulky than otherwise possible.

Available in a wide range of sizes and with two, three, or four conductors, G-E Geoprene cable resists heat, sunlight, abrasion, oils, acids, alkalies, and flame. To find out about these and other advantages that this cable provides, write Section W18-1014, Construction Materials Department, General Electric Company, Bridgeport 2, Conn.

GENERAL ELECTRIC

Better Stoker Feed

Ashland
PERMATREAT
COAL SPRAY
seals in dust

...IMPROVES THE FLOW AND PROTECTS INDUSTRIAL EQUIPMENT

Industrial users of stoker coals are finding that PERMATREAT, the oil-base coal spray, offers many advantages in firing and handling stocks. This treatment, first of all, settles the dust and dirt problem by sealing in the fly dust. Stocks remain more uniform for easy handling and firing. The dangers of hot spots and spontaneous combustion are lessened. PERMATREAT acts as a lubricant and rust inhibiter in all your handling equipment. It also causes coal to de-water faster, both in the car and in the stock pile. This prevents freezing, makes stocks easier to handle, improves firing.

PERMATREAT gives lasting protection, will not wash off and remains completely effective as a dust-proofing agent until the coal is used. It is easy to apply at the mine, in the yard or before stockpiling at unloading docks.

Ask your Supplier for Ashland OIL-TREATED COAL

ASHLAND OIL & REFINING COMPANY
Ashland, Kentucky

"Eucs" CUT COSTS for

MORGAN MINES, INC.

Starting with only four "Eucs", Morgan Mines, Inc., now owns and operates 17 Euclid Bottom-Dump Coal Haulers of 20 ton capacity at open pit mines in southern Illinois and western Pennsylvania.

"We use 'Eucs' because they haul more coal from pit to tipple faster and at lowest cost per ton", says Mr. Harrison Eiteljorg, president of the company. "Our experience with Euclids has been so satisfactory that they are now standard hauling equipment at three of our operations and will be used at our new mine at Herrin, Illinois".

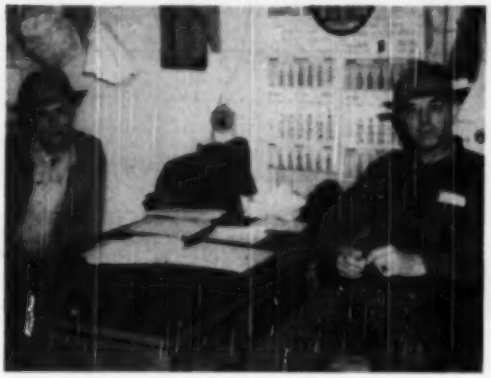
This comment is typical of many received from open pit operators who select Euclids for their off-the-road jobs. Economical performance under a wide range of operating conditions makes Euclids *your* best bet for low hauling costs.

THE EUCLID ROAD MACHINERY CO., Cleveland 17, Ohio

EUCLIDS *Move the Earth*

COAL MEN ON THE JOB

GAY COAL & COKE CO., Mt. Gay, Logan County, W. Va.: A. J. Jenkins (left), superintendent, Nos. 2 and 3 mines, and J. S. Laird, assistant to the general manager; Earl G. Compton (left, in right photo), and William Collins, section foremen; E. T. Kitchen, night foreman, and John Dean, general mine foreman, No. 2 mine.



AT WEST KENTUCKY COAL CO., Madisonville, Ky.: William Hill (left), superintendent, Roland Lamb, supply-house manager, and Pete Shoulders, washery foreman, East Diamond mine; and C. P. Tilford, central-shop superintendent.

UNITED MINE WORKERS OF AMERICA

August 29, 1950.

MEMORANDUM TO: WILLIAM GREEN

FROM: JOHN L. LEWIS

You know, Bill, that I am ever distressed when I have to disturb the calm placidity of your ordered existence. Yet I suggest that the rights of American workers in industry should not be bartered to appease your innate craving for orthodox respectability. Consideration of the following items is therefore indicated:

1. Although the Mineworkers have espoused labor unity, you have stipulated them out of the unity conferences. It follows that any mess that you cook up with the C.I.O., if you can cook up any mess with the C.I.O., will of course have to be eaten by you, and you alone. We do our own cooking.

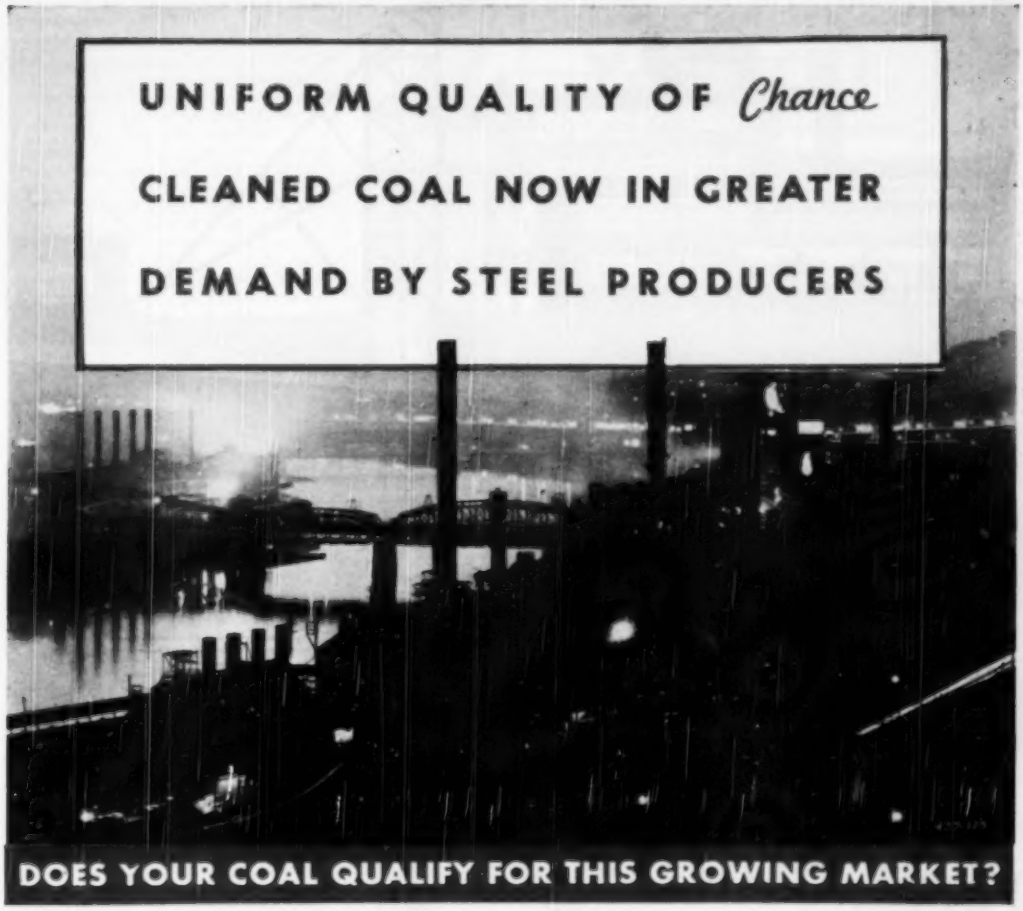
2. You have stipulated the Mineworkers out of representation on the select, Star Chamber labor committee which you designated to please Symington. We gently advise that we will not be bound by your deliberations or commitments conducted or made in our absence. We do our own committing.

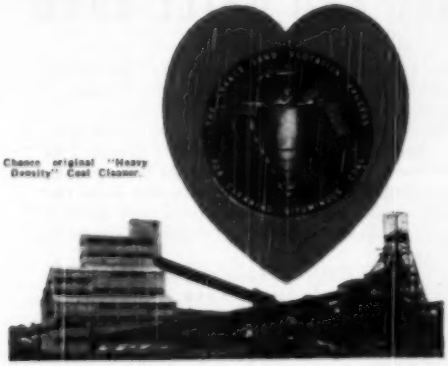
3. The press chronicles you as plodding about the country seeking someone to whom you can give a "no-strike pledge." I am sure that you will pardon me when I suggest that the Mineworkers are not yet ready for you to sell them down the river. Restrict your pledges to your own outfit. We do our own no-striking.

". . . We do our own no-striking."

Silent for some months, John L. Lewis once again made the headlines across the nation when he released this letter, written to William Green, AFL president.

Two recent labor developments seemed to have prompted the outburst. The CIO had previously initiated a unity conference and had invited Mr. Lewis to participate, but the AFL had agreed to meet with only the CIO. In addition, the UMWA was excluded from direct representation on the labor advisory committee to Stuart Symington, chairman of the National Security Resources Board. Along with other unaffiliated unions, it was represented by the president of the International Association of Machinists. Mr. Lewis also apparently had noted Mr. Green's statements that the AFL was ready to give a no-


UNIFORM QUALITY OF Chance
CLEANED COAL NOW IN GREATER
DEMAND BY STEEL PRODUCERS
DOES YOUR COAL QUALIFY FOR THIS GROWING MARKET?



Chance original "Heavy Density" Coal Cleaner.

The steel industry needs more uniformly clean coal . . . coal that can be converted with minimum loss into highest quality coke. It takes a scientifically and uniformly prepared coal to provide this necessity — and producers whose plants are equipped to supply this "metallurgical coal" are reaping the benefits in premium prices.

Are your preparation methods producing coal of uniformly high chemical and physical quality to enable you to compete successfully? If you'd like help or advice call on the FAIRMONT ENGINEERS.

FAIRMONT designs and builds complete coal preparation systems . . . Chance Sand Flotation Process for Wet Cleaning and American Pneumatic Separator for Dry Cleaning.

FAIRMONT MACHINERY COMPANY
FAIRMONT, WEST VIRGINIA

Designers and Constructors of Chance Sand Flotation Process for Wet Cleaning and American Pneumatic Separator for Dry Cleaning.

HAZACORD

REMOTE CONTROL AND DRILL CORD

Yes—3 to 5 times longer life is the service you are assured with Hazacord Remote Control and Drill Cord. The durability of its extra thick tire-tread tough ZBF sheath better withstands the punishment drill cords must take...and permits approved use in remote control systems without the costly time-consuming extra protection of conduit.

Hazacord Remote Control and Drill Cord is research-developed and service tested to give uninterrupted electrical service under the severest operating conditions. Vulcanized in a continuous metal mold, the Hazaprene ZBF Sheath is dense and resilient...withstands the constant abrasion and run-overs of mine floor service day in and day out. Yet this sheath is so flexible that the cable can be repeatedly bent around a radius six times its own diameter without endangering its long life. Special fillers add strength to the cord and prevent wicking in of moisture through cable ends. This Hazard construction stands up under the excessive strain of pulling and tugging that drill cord receives.

Maximum flame-resistance—so essential to safe operation—is provided by the Hazaprene ZBF Sheath. Like other Hazacord mining cables, Hazard's Remote Control and Drill Cord more than meets the flame test requirements of the State of Pennsylvania and the U. S. Bureau of Mines, and is so marked at frequent intervals on each cable.

You will find Hazacord Remote Control and Drill Cord fully described in Hazard's new 72-page manual of electrical mining cables. If you don't already have your copy, just send us your name, title and company, and we will see that you have it promptly. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pennsylvania.

HAZARD Insulated wires and cables for every mining use

8541

strike pledge whenever it was needed for national defense.

Mr. Green immediately replied to Mr. Lewis, pointing out "that there is a difference between practicing labor unity and espousing it." Commenting on the UMWA withdrawal from the AFL after the 1947 convention, he declared that "I know that you and those associated with you gave the impression at that time that your plans for the future called for the operation of the UMW upon a separate and isolationist basis. Am I to understand now that you have changed your mind and wish to become a part of the united labor movement? It will be very difficult now to make a large number of members who are part of our organized labor movement believe that you favor labor unity. He also reiterated the AFL's readiness to make a no-strike pledge "whenever the President of the United States advises us such action is necessary in order to protect our country against Communist aggression."

Personal Notes

K. L. Konnerth, formerly general manager of operations, has been elected vice president and general manager of operations for the H. C. Frick Coke Co. and the U. S. Coal & Coke Co. Associated with the companies for 28 yr, Mr. Konnerth will, in his new post, direct the operating policies of the two U. S. Steel subsidiaries, Harry M. Moses, president, announced.

L. H. Chalfant, superintendent, Ellsworth Div., Bethlehem Collieries Corp., has been named assistant manager of mines for the company. **K. W. Bartlett,** formerly superintendent, Bethlehem Mine No. 43, Carolina, W. Va., has succeeded Mr. Chalfant as superintendent of the Ellsworth Div.

T. L. Aitken, formerly general manager, has been elected vice president in charge of operations for the Ebensburg Coal Co., effective Sept. 1.

Seth H. Kegan, formerly superintendent of Mine No. 214, McRoberts, Ky., has been named director of public relations for the Consolidation Coal Co. (Ky.), with headquarters at Jenkins, Ky. **J. C. Dann,** formerly superintendent at the company's Winters mine, has been appointed superintendent at Mine No. 214, to succeed Mr. Kegan.

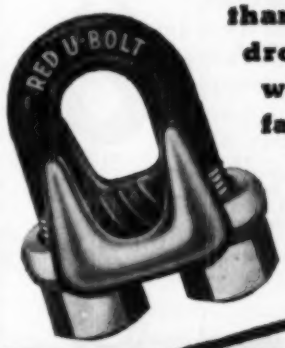
Ralph C. Ison has been promoted from mine foreman to superintendent, No. 3 Elkhorn mine, Pond Creek Pocahontas Co., Breathitt County, Kentucky, according to an announcement by W. A. Haslam, manager of the Kentucky-Elkhorn Div. A Navy vet-

Our cheapest insurance against
X-SHOCK!

● "Crosby Clips? Of course we use 'em . . . we need 100% reliability in setting steel," says Dan Hewett, superintendent for the John Beasley Construction Company, erecting steel for the new bridge over the Mississippi River at Hastings, Minnesota. Dan is holding one of the hundreds of Crosby Clips going into the Hastings job. "Been using 'em for years . . . have found them completely reliable because they've got *extra strength* when you need it."

He's talking about "X-Shock", that sudden blow or strain or overload on wire rope that engineering can't calculate. To guard against it, CROSBY Clips have tremendous reserve strength. Be *sure* of safety for the men and equipment on your job . . . use only genuine CROSBY Clips!

Industry uses more
CROSBY CLIPS
than all other drop-forged wire rope fasteners!



This is an AMERICAN Self-Locking Snatch Block . . . capacities 1½ to 5 tons. Other AMERICAN wire rope blocks to 250 ton sizes.

There is only one genuine CROSBY Clip—identified by the famous red U-bolt. Drop forged from finest steel. Hot dip galvanized—a thin, tough, chip-proof zinc coat. Machine cut threads, chamfered bolt ends. Sizes for ⅛ to 3" wire rope—at distributors everywhere.

MAIL THIS COUPON FOR FREE BOOK

American Hoist & Derrick Company
St. Paul 1, Minnesota

● Please send free book about CROSBY Clips and their uses.

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Add a BIG *SAFETY* FACTOR to your hoist

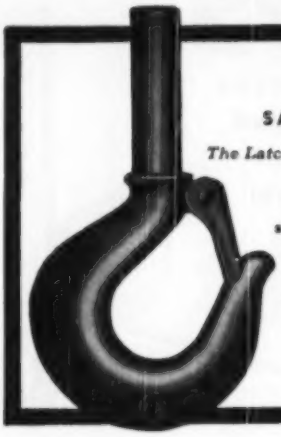
A Laughlin Safety Hook will boost the "safety efficiency" of your hoist many times . . . protecting workers against injury and equipment against damage from accidentally slipping loads.

Make sure your next Hoist is equipped with a LAUGHLIN SAFETY HOOK

Specify "Laughlin Safety Hooks" when ordering new hoists from your distributor. They pay for themselves many times over in accidents avoided.

Play safe — change over your present Hoist Hooks to LAUGHLIN SAFETY HOOKS

Order from your distributor according to the size now on your hoisting equipment . . . or state the capacity of your hoist and he will furnish the correct Laughlin Safety Hook to fit your needs.



LAUGHLIN SAFETY HOOK

The Latch Locks the Load

Drop-forged steel, heat-treated . . stainless steel spring with pressed steel latch. Cast bronze latch on larger sizes. Available for ½ to 15 ton safe working loads.

There is a **LAUGHLIN SAFETY HOOK** *for every* **HOISTING or MATERIALS-HANDLING JOB**

3310
½ to 15 tons

3220
½ to 15 tons

3316
½ and 1 ton

3315
750 pounds

Send for Laughlin's famous data book of fittings — ask for Catalog #145. THE THOMAS LAUGHLIN COMPANY, DEPT. 6, PORTLAND 6, MAINE.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS

teran, Mr. Ison brings 18 yr of coal-mine supervisory experience to his new position. **Mack H. Shumate**, formerly a special engineer for the Island Creek Coal Co., has been named assistant to the manager, it also was announced. **Charles K. Tudor**, a recent graduate in mining engineering from the University of Kentucky, has been appointed engineer-in-training.

Albert S. Kemper Jr. has joined the Eastern Coal Corp., Eastern Coal Sales Co., Premier Pocahontas Co., The Tierney Co., and the Laurence E. Tierney Land Co., in an executive capacity on a full-time basis, effective Sept. 1. A lawyer by profession, Mr. Kemper has been a resident of Bluefield, W. Va., for 25 yr and in his law practice has been closely associated with matters pertaining to the coal industry. He has been a partner in the firm of Richardson & Kemper for many years.

Denny J. Smith has been elected assistant secretary and assistant treasurer, Penowa Coal Co., Burgettstown, Pa. A graduate of Washington and Jefferson College and Harvard University, Mr. Smith has been associated with the company in various capacities for the past several years.

A. E. Epling, general superintendent, Spruce River Coal Co., Ramage, W. Va., has been elected vice president in charge of operations and a member of the board of directors for the company. **Douglas R. Cook**, a 1950 graduate of the School of Mines, West Virginia University, has joined the company as a mining engineer.

Richard T. Todhunter, Jr., general manager, Barnes & Tucker Co., Barnesboro, Pa., left last month for a 3-wk tour of English coal mines. During the trip, Mr. Todhunter planned particularly to study roof conditions and the latest types of machinery used in British mines.

Ken Williams has been made mine foreman in charge of the recently opened No. 3 tunnel of the new Weirton mine of the National Mines Corp., Morgantown, W. Va.

E. E. Quenon has been named to head the Mt. Hope, W. Va., office, USBM. Mr. Quenon, who joined the Bureau in 1929, has been acting chief of the Mt. Hope branch since the retirement of Alex Miller last March.

Clarence B. Nixon, who has been associated with the Fort Pitt Coal Co., operator of strip mines in western Pennsylvania and Ohio, has been appointed by Pennsylvania's Gov. Duff as judge of the Common Pleas Court.

Supervisory appointments at mines of Eastern Gas & Fuel Associates include the promotion of **Glen McGuire** to section foreman at Wharton No. 1 mine. At Helen, W. Va., **L. C. Snyder** and **Charles Blevins** have been employed as foremen at No. 11 and No. 9

PUT STRENGTH UNDER RAILS

Bethlehem's No. 5 Steel Tie is a husky, rugged brute that is built to carry the crushing loads of today's mechanized equipment—the massive cutters, loaders, and motors that impose such a heavy burden upon the track structure.

The No. 5 will take such loads in stride. Broad, deep, and thick, it effectively resists vertical pressure; doesn't flatten out, buckle, or sag. Down the center-line, a special channel construction gives added support where it is needed most.

The tie costs only a little more than those of lighter section . . . and the slightly higher first cost is more than offset by increased life. Especially is this true in modern mining practice, where the trend is so definitely in the direction of heavier track-mounted equipment and bigger car loadings.

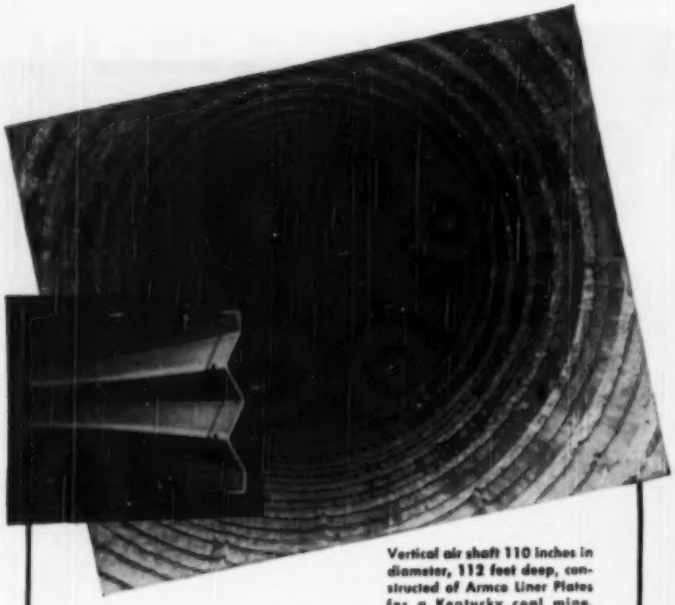
Installing the No. 5 is a quick, easy matter. Simply fit the stationary clip against the rail base; then tap the revolving clips into place. Repeat at the other end of the tie. That's all there is to it.

For good track from the ground up, make liberal use of Bethlehem No. 5's. They're a solid buy.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation



Vertical air shaft 110 inches in diameter, 112 feet deep, constructed of Armco Liner Plates for a Kentucky coal mine.

Gain Fresh Air–Greater Safety QUICKLY and ECONOMICALLY

Here's a quick, low-cost way to provide ventilation and safety as your mine workings extend back from original openings. Simply use Armco Tunnel Liner Plates to sink new shafts.

Work moves surprisingly fast and labor costs are low. A single unskilled workman can carry, hold and bolt into place an Armco Liner Section. No special tools are required. Excavation is kept to a minimum.

Corrugated metal design gives Armco Plates plenty of strength. There is a size and gage to meet almost every need. Diameters range from 45¼ inches to 33 feet, gages from No. 14 to No. 3.

Use Armco Tunnel Liner Plates for sloped and vertical entries, overcasts, substations and escapeways. Write for complete information. Armco Drainage & Metal Products, Inc., 4270 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

ARMCO TUNNEL LINER PLATES

ARMCO

mines, respectively. **Kenneth Johnson**, recently night general foreman at Midvale mine, has returned to Powellton No. 6 mine. **J. D. Shupe** and **James E. Haga** has been promoted to section foremen on the No. 2 shift at Eccles mine.

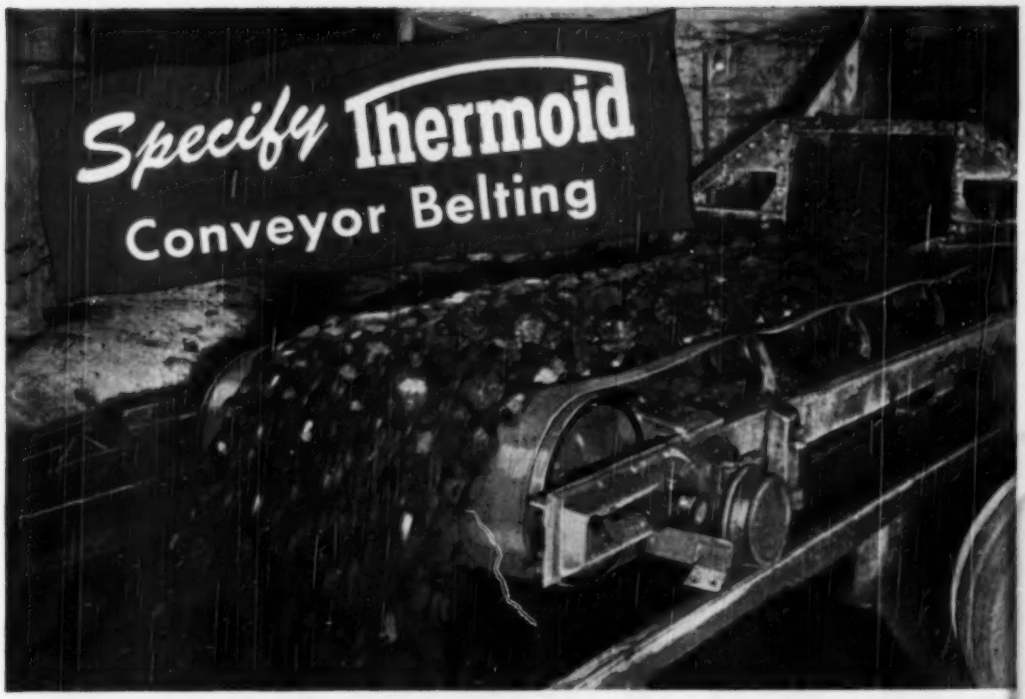
Davis Read Opens Office As Mining Consultant

Davis Read, for the past 10 yr chief engineer in charge of production for the West Kentucky Coal Co., Inc., has announced the opening of offices in Madisonville, Ky., and his availability as a mining consultant to producing companies in that and other fields.

Mr. Read, who on Aug. 1 terminated more than 40 yr of active service with West Kentucky Coal, continues with that company in a consulting and advisory capacity. He joined West Kentucky in 1908 and except for a short period between 1916 and 1918 has been continuously associated with it, first as a mining engineer and since 1918 as chief engineer.

In the past 10 yr, during which Mr. Read served as chief engineer in charge of all mining operations and related production matters, the company has made great strides in increasing output and modernizing its mines and preparation facilities. In 1949, it moved up to 12th place among the Nation's coal producers and its mines and plants are considered among the most modern and efficient in the industry.

As a member of the NCA Vocational Training and Education Committee and president of the Kentucky Mining Institute, Mr. Read has played a prominent part in coal mining activities in the area. He has been very active in initiating and directing various vocational and mining-engineering training courses locally, and in encouraging young men to become associated with coal mining, and plans to continue this work.



Thermoid Shuttle Belts Feed Tons of Coal to Surge Bins . . . Cut Conveying Costs!

Thermoid Belting is a consistent cost-cutter because it carries maximum tonnage, requires little maintenance, and stands up under plenty of punishment.

Whether the job is handling ore, coal or rock, Thermoid Conveyor Belts stay on the job—long after other belts fail. Fewer delays due to belt-breakage . . . belt-slippage . . . premature wear and tear.

Your Thermoid Distributor carries a complete stock to meet your requirements. Thermoid Field Representatives are available to help you select the right Thermoid Belting for your job. Broad experience in *all* fields of industry equip Thermoid Engineers to recommend the belt that can best perform the tasks you assign it in your daily operations.

It will pay you to

Specify Thermoid

For economy, strength, load-capacity, your belting dollars buy more potential operating profit with Thermoid.

Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.

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BEE-ZEE ROUND ROD SCREENS

By lasting 10, 20—sometimes 30 times longer than ordinary screens, Bee-Zee Screens solve an important production problem for coal operators. Here's the secret of Bee-Zee long life—

ROUND ROD DESIGN keeps screen openings the same, even with as much as 50% wear on top rods.

STAINLESS STEEL is used for both top and tie rods to resist corrosion and rust . . . to withstand abrasive action.

FINE POINT OF CONTACT between top and tie rods leaves no "pocket" to cause clogging or blinding of screened coal.

WELDED CONSTRUCTION by precision spot welding provides uniform accuracy and prolongs screen life.

BUILT-IN TENSION eliminates stretch tensioning, a frequent cause of screen fatigue and failure.

Bee-Zee Screens can be fitted to any coal processing equipment.

Write for free copy of the Bee-Zee catalog for complete information about Round Rod Screens in the coal industry.

BIXBY-ZIMMER ENGINEERING COMPANY

1100 Abingdon Street, Galesburg, Illinois

Among the Manufacturers

Gould-National Batteries, Inc., became the new name of the National Battery Co. Aug. 1 when the stockholders of the latter firm approved the change. The same sales and field engineering organizations, formerly serving industry under the name of the Gould Storage Battery Corp., will now operate under the new name of Gould-National Batteries, Inc., and headquarters for the group will continue in Trenton, N. J. The policies, management and operation of Gould-National Batteries, Inc., will remain the same as those followed heretofore by Gould and by National. M. W. Heinritz, formerly vice president of Gould Storage Battery Corp., has been elected vice president in charge of industrial sales of Gould-National Batteries, Inc.

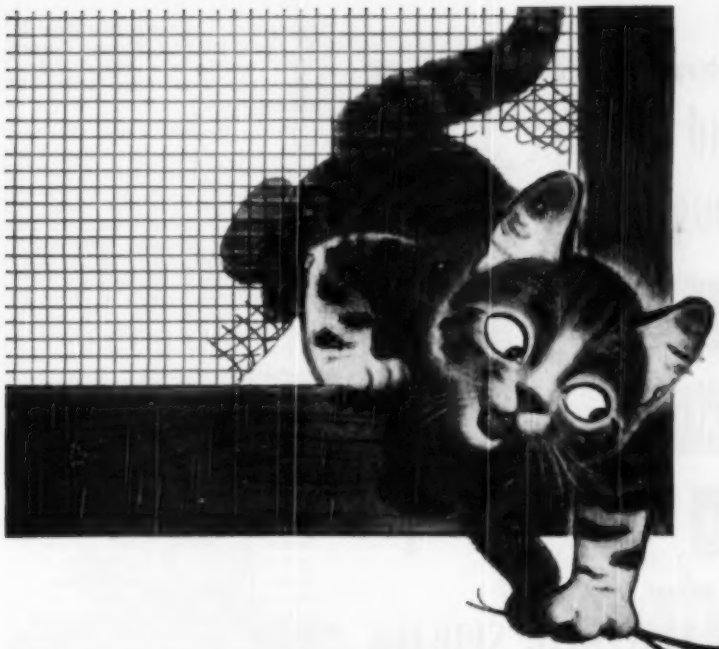
Charles L. Baer, 75, general manager, The Connellsville Mfg. & Mine Supply Co., Connellsville, Pa., died suddenly at his home Aug. 23. Mr. Baer joined the Connellsville company in 1902 and was made general manager in 1926, succeeding Dan F. Lepley, one of the early pioneers in the development of modern mine equipment, who died that year.

Russell J. Dickson has been named district manager for the Chicago ter-

COAL MEN ON THE JOB

SAFETY AND PRODUCTION TEAM—Brothers C. E. Self (left), safety engineer, and D. A. Self, mine foreman, Sunnyside mine, Kaiser Steel Corp., Sunnyside, Utah. RIGHT PHOTO—Ray Dennison (left), mechanic, and Wimer Wright, assistant master mechanic, study a print before tackling a locomotive repair job at Sunnyside mine.

ACCOUNTING AND MINE SUPERVISION keep George Graham (left), chief clerk, and A. W. Newcomb, superintendent, busy at Sterling mine, McNeil Coal Corp., Dacono, Colo. RIGHT PHOTO—Walter A. Meek, resident engineer, and Frank E. Bousfield, assistant engineer, Frederick mine, C. F. & I. Corp., Valdez, Colo.



*PENETRATION

Peak production . . . without worry of breakdown due to friction and wear . . . is made easier with Tycol high quality greases.

Made to "absorb punishment" without thinning down and dripping, Tycol greases avoid wasted lubricant, lost bearings and unnecessary down-time. These ultra-safe lubricants keep bearings . . . gears . . . shafts . . . friction-free and cool. They are available in grades with the proper "*PENETRATION" needed to give power a chance to produce with a minimum of waste.

Call your nearest Tide Water Associated office. Let them suggest the Tycol grease best suited to your needs . . . and remember, Tycol green cast greases are made from high quality cylinder stock and well refined neutral oil, with a minimum of soap — a maximum of oil . . . more efficient lubrication per pound of grease.

TYCOL

INDUSTRIAL LUBRICANTS

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TIDE WATER ASSOCIATED OIL COMPANY

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*LEARN WHAT THIS PRODUCT CHARACTERISTIC MEANS TO YOU — READ "LUBRICANIA" This informative handbook, "Tide Water Associated Lubricania," gives clear, concise descriptions of the basic tests used to determine important properties of oils and greases. For your free copy, write to Tide Water Associated Oil Company, 17 Battery Place, New York 4, N. Y.

REFINERS AND MARKETERS OF VEEDOL — THE WORLD'S MOST FAMOUS MOTOR OIL

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CAR PULLER AND RETARDERS

LABORATORY CRUSHERS

Modern Methods Demand Careful Handling

Breakage is practically eliminated

Separation is held to a minimum

Impact is dispelled from bin structure

when you select

HOLMES LOWERING SPIRALS

Lowering speed of coal is automatically regulated to a uniform rate, carrying it gently to the peak of the pile without droppage.

Improved design and simplified construction of Holmes Spirals assures easy erection in your bins or silos.

You are receiving the results of our more than 20 years' experience and accumulation of field data from many satisfied customers.

Why not call on Holmes engineers to assist on your coal lowering problems? We'd like to receive your inquiry—prices and recommendations will be furnished without obligation on your part.

ENGINEERS, MACHINISTS
STEEL FABRICATORS
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GREY IRON FOUNDERS

DANVILLE ROBT. HOLMES BROS. ILLINOIS

HOISTS

VIBRATING SCREENS

DUSTOLATORS

ROBERT HOLMES & BROS., INC.
DANVILLE, ILLINOIS

ritory of A. Leschen & Sons Rope Co., St. Louis, Mo. Mr. Dickson succeeds Mark Arnold, who retired July 1 after 47 yr of continuous service with the company.

Carter Products Corp., Cleveland, Ohio, has changed its company name to Carlon Products Corp., in line with company policy to consolidate all products and facilities under its trade-name "Carlon." Sales of Carlon extruded plastic products have increased so rapidly within the past 9 mo that existing production facilities have been unable to meet the growing demand, the company reports, and a new plant has been established in Corsicana, Texas, to provide greater capacity.

General Electric Co. has named J. David Wright assistant manager of its Industry Divisions at Schenectady. He will be replaced in his former position as manager of the company's Industrial Engineering Divisions by Frederic M. Roberts. Concurrently, Mr. Roberts announced that Leonid A. Umansky will assume the post of manager of engineering of the Industrial Engineering Divisions. In his new capacity, Mr. Wright will assist in the supervision of a number of divisions which comprise the application, service and construction engineering group of the Industry Divisions. Mr. Roberts will be responsible for the supervision of, and Mr. Umansky will have engineering responsibility for, mining and other divisions.

Edward A. Green has been appointed staff assistant to A. W. Bartling, general sales manager of GE's Small Apparatus Divisions, with headquarters at Lynn, Mass. He will be replaced in his former position as manager of sales of the company's Control Divisions by L. Dean Fowler, formerly manager of the San Jose (Calif.) Motor Sales Division, Small and Medium Motor Divisions, who will now be located at Schenectady, N. Y.

Euclid Road Machinery Co., Cleveland, Ohio, has appointed Foulger Equipment Co., Salt Lake City, Utah, distributor for Utah, southwestern Wyoming and the northeast section of Nevada. A new building now under construction at the company's present location will be ready for occupancy in the near future. B. L. Foulger is president; O. M. Foulger, treasurer; and J. T. Holland, sales manager.

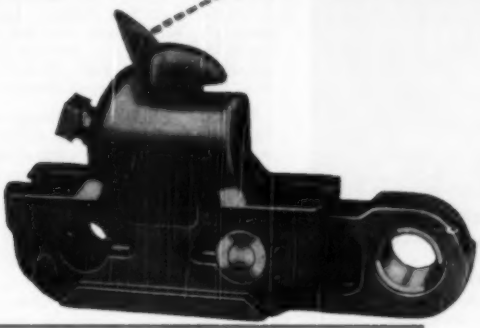
Leonard E. Bees, manager of manufacturing for the past year, has been appointed vice president in charge of manufacturing for all plants of The Trumbull Electric Mfg. Co., Plainville, Conn.

Ajax Flexible Coupling Co., Inc., Westfield, N. Y., has appointed J. S. (Steve) Thurlow, manager of the Thurlow Equipment Div., G. Donald Bradley Co., Seattle, Wash., a new representative to cover the states of Washington, Oregon and Idaho on all

PROX

DUOMATIC CHAIN *assures*

DEPENDABLE PERFORMANCE . . . ADDED SAFETY . . . EXTRA LONG SERVICE . . . QUICK AND EASY MAINTENANCE



Here are the reasons for

DUOMATIC CHAIN *EFFICIENCY*

- of strapless design—it is rigid and compact.
- no bulky heads that must be pulled through the cutting operation
- interlocks are machined—pins and bushings are hardened for longer cutting life
- no chain whippage as it comes off the drive sprocket
- Sumps easier—cuts easier thereby eliminating the cloud of dust normally created in the cutting operation
- parts may be easily replaced in a few minutes on the job

PROX Duomatic Chain can be purchased for using either the DUO Bit or the TOOL STEEL Bit.

PROX TOOL STEEL BITS

A drop forged bit of fine alloy tool steel has been in service since 1938.

Noted for ruggedness and ability to stand abuse over any other manufactured bit.

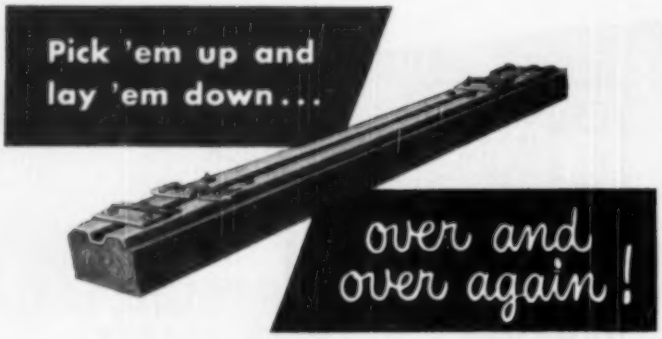
This bit has been cutting coal for the largest coal companies for the past 10 years.

- **Assures uniform bit gauge**
- **May be changed quickly**
- **Circular back edge is strongest possible design**
- **Each of these TOOL STEEL points cuts at least as much as a hard tipped ordinary mine bit**

SEND FOR CIRCULAR

FRANK PROX COMPANY
INC.
TERRE HAUTE, INDIANA

PROX
ON THE BANKS OF THE WABASH — SINCE 1875



KOPPERS Ar-Moored MINE TIES

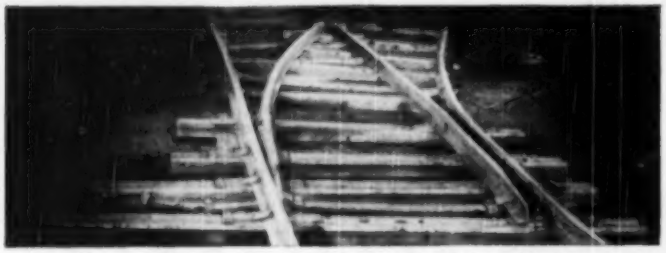


Photo Shows Koppers Ar-Moored Switch Tie Set Before Ballasting and Surfacing

▶ Nothing is tougher on ties than being lifted and relaid. Ordinary mine ties soon succumb to "spike-kill" . . . usually are scrapped after being relaid four or five times. Not so with Koppers Ar-Moored® Ties! One user reported that he relaid his ties *over fifty times* and then "quit keeping count."

For temporary track in mechanized mines, Koppers Ar-Moored Switch and Cross Ties are ideal. Not only can these ties be relaid easily, quickly and repeatedly, but they also provide a stable, strong track with accurate gauge—a track that stands up under heavy mine traffic.

Koppers Ar-Moored Ties have preformed, prebored, pressure-creosoted oak bases, topped with Bethlehem Steel Mine Ties. This combination of steel, plus decay-resistant wood, results in ties that *maintain* rail alignment, thus helping to eliminate derailments. Moreover, these ties are tampable; they do away with spiking and gauging; they resist damage caused by caterpillar tracks.

Add up all these advantages and you'll see that it's safer, easier and more economical to use Koppers Ar-Moored Ties. For further information, send for our free book: "10 Proven Ways to Cut Mining Costs." It also describes how you can effect substantial savings by using Koppers Pressure-Treated Wood in many other ways. There's a handy coupon below.

KOPPERS COMPANY, INC., Pittsburgh 19, Pa.

KOPPERS

PRESSURE-TREATED WOOD

Koppers Company, Inc.
Dept. CA-10
Pittsburgh 19, Pa.

Please send me a free copy of *"10 Proven Ways to Cut Mining Costs."*

Name.....

Address.....

City..... Zone.... State.....

Ajax Products except flexible couplings. Boyd Goodhart, 1425 Troost Ave., Kansas City, Mo., has been named a representative to handle the complete Ajax line in western Missouri and Kansas.

Dr. Robert J. Wiseman has been appointed vice president and chief engineer of The Okonite Co., Passaic, N. J. Dr. Wiseman joined the company in 1921 as research engineer and was chief engineer until his new appointment.

Iron & Steel Products, Inc., Chicago, has announced that W. E. Corr, Norfolk, Va., is no longer associated with the company.

Koehring Co., Milwaukee, has appointed Construction Equipment Co., Birmingham, Ala., distributor in Alabama and northwestern Florida. Headed by Robert F. McCullough, president, and Dan Dodge, general manager, the company also will represent the Parsons Co., Newton, Iowa, and Kwik-Mix Co., Port Washington, Wis., both Koehring subsidiaries.

Reliance Electric & Engineering Co., Cleveland, Ohio, has announced three new engineering appointments. John L. Fuller has been appointed technical coordinator, with responsibility for engineering coordination of special drives, technical investigations and direction of Reliance's experimental program. Mr. Fuller previously was responsible for engineering on the company's large motors. Charles R. Sutherland, who formerly directed engineering for smaller size motors, has been promoted to the new position of manager of engineering for the company's Ivanhoe Div. products. Named manager of engineering for the Ashtabula Div. products, was Earl E. Barnes, who since 1947 has been responsible for electrical design of both ac and dc products manufactured at that plant.

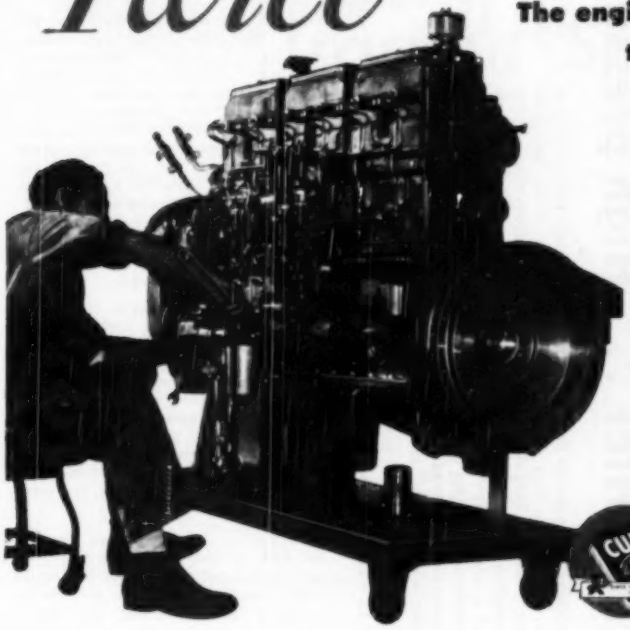
M. C. Larson has been made manager of the Baltimore sales office of Cutler-Hammer, Inc., Milwaukee, replacing R. A. Haworth who has been appointed Dallas district sales manager. With the company since 1929, Mr. Larson has been in the Philadelphia sales office for the past 2½ yr.

International Harvester Co., Chicago, last month has announced start of construction work on a new building to house a service parts depot and a machine transfer in Broadview, a suburb of Chicago. The one-story building will cost approximately $5,000,000 and will have a floor area of some 26 acres, located on a 70-acre tract. The parts depot, the ninth of Harvester's network of 12 to be installed throughout the United States, will serve as a wholesale parts distribution center for Illinois, Indiana, western Michigan, southern Wisconsin, eastern Iowa, and northern Kentucky, and for export shipments. The machine transfer will distribute IH

Cummins® Custom-built Diesels

Built not once but Twice

The engine that's built better to give power at lower cost



Why is a lightweight, high-speed Cummins Diesel the best buy in economical, dependable power? *Because every* part of *every* engine is made under strictest quality control methods. Each engine also is actually built *twice*. After initial assembly, each engine is run-in on the test block. Then it is torn down and carefully re-inspected—after that it is re-assembled and tested *again*.

Perfection in engine craftsmanship . . . Cummins exclusive fuel system . . . an unexcelled service and parts organization . . . mean that rugged, dependable Cummins Diesels make more profits for power users.

There's a model for your power needs. Contact your Cummins dealer. He has more facts to show you about making more profits with

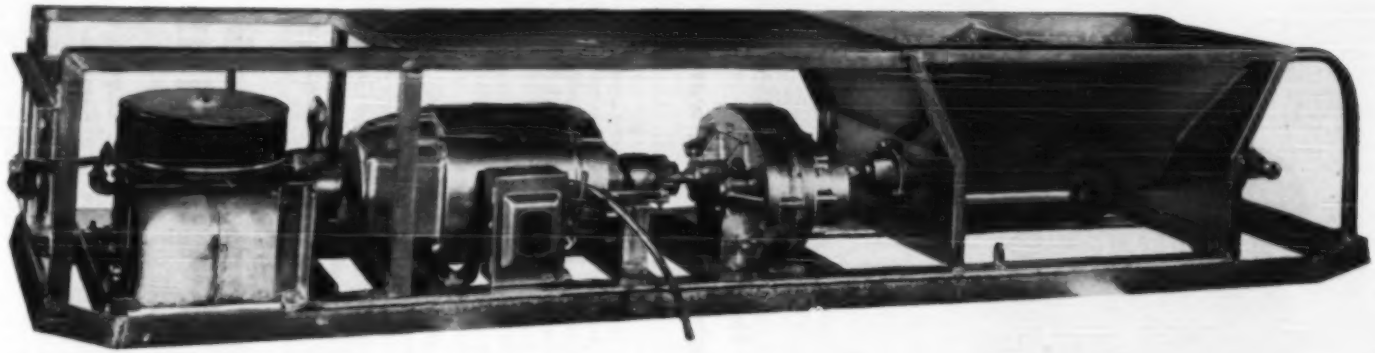
Diesel power by CUMMINS

TRADEMARK REG. U.S. PAT. OFF.

CUMMINS ENGINE COMPANY, INC. • COLUMBUS, IND.

EXPORT: CUMMINS DIESEL EXPORT CORPORATION
Columbus, Indiana, U.S.A. • Cable: Cumdiex

Lightweight High-speed Diesel Engines (50-550 hp) for: On-highway trucks • off-highway trucks • buses • tractors • earth-movers • shovels • cranes • industrial locomotives • air compressors logging yarders and loaders • drilling rigs • centrifugal pumps generator sets and power units • work boats and pleasure craft.



"LITTLE CHIEF"..., High pressure portable "Dustributor"

The Little Chief has been designed to overcome the laborious work of moving a machine from room to room for rock dusting in low-roof mines. With the cable hooked to a crossbar, it will pull itself onto a conveyor, over a conveyor or off the conveyor. Will be supplied with or without winch. With the rope attached to a jack it will travel 40 feet a minute regardless of height of roof or condition of floor. Saves lifting and backbreaking effort moving in low coal. Has sufficient power to permit continuous operation. Increased power gives increased distribution. Can be supplied with four disc wheels on ¾" axles, roller-bearing, with tire and tube O.D. 10".

It has ample power to distribute a larger quantity of dust through 50 to 250 feet of 1¾" hose. Hose can be connected or disconnected rapidly with the quick-acting clamp provided. Loosening two wing nuts permits access to valve and conveyor discharge to remove any obstruction.

May be had dust tight or Bureau of Mines approved, permissible with trolley tap or permissible running plug for use on shuttle car.

THE AMERICAN DOOR MINE CO.
2057 DUEBER AVE., CANTON 6, OHIO

motor trucks, farm tractors and farm implements, industrial power equipment, etc., to a somewhat larger area. The new facilities are designed to offer faster and more complete service to IH customers in the area, the company reports.

John C. Coonley has been appointed manager of the Valve Div., American Car & Foundry Co., with headquarters in Detroit, succeeding W. R. Kottsieper, who is retiring after more than 44 yr of service with ACF. Mr. Coonley formerly was with the Walworth Co., before joining ACF earlier this year as assistant manager of the valve division.

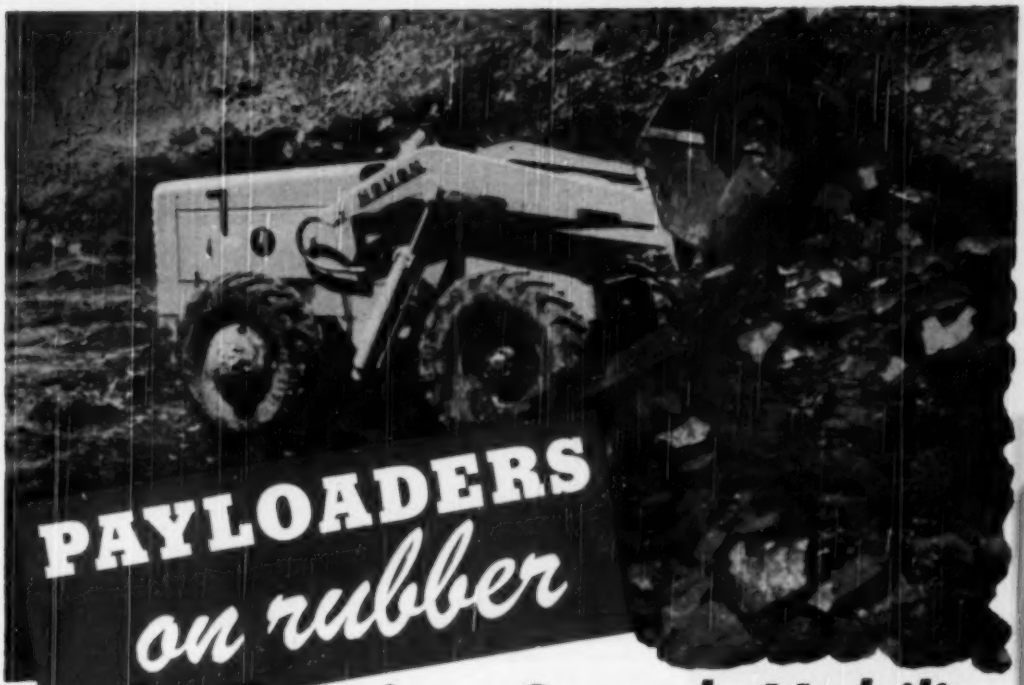
Kaiser Steel Corp., Oakland, Calif., has elected Atwood Austin, formerly financial consultant for several of the Kaiser companies, vice president and treasurer. C. F. Borden, general sales manager for Kaiser steel since 1947, has been named vice president in charge of sales.

Steelcraft Mfg. Co., Rossmoyne, Ohio, has named Alan R. Mendenhall sales manager of its Steel Building Div. Nat L. Lehman will continue as sales manager of the Building Products Div. Mr. Mendenhall previously was associated with the Geo. L. Mesker Co., Evansville, Ind., as executive vice president and manager.

Two West Coast subsidiaries of the U. S. Steel Corp. have announced plans for expanded steel-finishing facilities. Additional cold-reduced-sheet and tin-plate facilities will be installed at the Pittsburg, Calif., plant of the Columbia Steel Co., with an annual capacity of approximately 215,000 net tons of sheets and tin plate. Geneva Steel Co. has reported plans for the installation of new facilities at its Geneva, Utah, plant, for the production of an additional 100,000 net tons of hot-rolled steel sheets annually.

Flexible Tubing Corp., Branford, Conn., is planning to move into its new 13,000-sq ft brick and steel plant in Guilford, Conn., on Nov. 15. The new modern one-story plant, now under construction, will accommodate 100 employees, with added space and layout flexibility provided for future expansion. Increased production resulting from increased customer demand necessitates the move, the company says.

Formation of Caterpillar Tractor Co., Ltd., a wholly owned British subsidiary, has been announced by Caterpillar Tractor Co., Peoria, Ill. To be primarily concerned with the wholesale distribution of parts made by selected British manufacturers, through the company's dealers in the UK and other countries, the new subsidiary will permit owners of Caterpillar equipment in those countries to obtain genuine Caterpillar products at competitive prices. Wallace J. Bornholdt, purchasing agent for Cater-



PAYLOADERS *on rubber* for Traction + Speed + Mobility

The Model HM Payloader is a new kind of profit-maker for both open pit and underground mines . . . a new kind of tractor-shovel whose large pneumatic tires and 4-wheel drive provide digging power and ground-gripping traction to go places and do things over any kind of ground. It will operate on coal veins without chopping and grinding the coal. It will dig, load, grade, carry, lift and push.

The 1½ cu. yd. bucket has full double-acting hydraulic power control and can be replaced quickly by a bulldozer blade, crane hook or lift fork attachment. There are four speeds in each direction, power-booster steering, fullest operator visibility and comfort, powerful hydraulic brakes, and other outstanding features. Your Hough PAYLOADER Distributor has full facts on the Model HM . . . see him today or write to The Frank G. Hough Co., 735 Sunnyside Avenue, Libertyville, Illinois.

CLEAN TOPS OF VEINS

FEED STRIPPING SHOVELS

LOAD TRUCKS

MAINTAIN ROADS

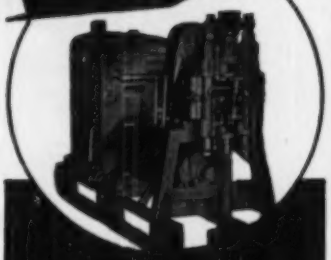
MOVE TOOLS AND SUPPLIES

LIFT • PUSH • CARRY

Send for literature on the Model HM 1½ yd. or any other size Payloader: the 1¼ yd. Model HL; the ¾ yd. Model HF; the ½ yd. Model HE; the 12 cu. ft. Model HA.

HOUGH
PAYLOADER
Manufactured by THE FRANK G. HOUGH CO.

Diamond Core Drilling
CONTRACTORS



Testing mineral properties with our light gasoline drills. SATISFACTORY COAL CORES GUARANTEED. Ground solidification by our pre-pressure grouting method for shafts. Wet mine areas, horizontal holes for drainage. Electric drills for inside mine drilling.

MOTT CORE DRILLING CO.
HUNTINGTON • WEST VIRGINIA

COAL MEN ON THE JOB

McCARTNEY COAL CO., Mon-Ark Mine No. 4, Mona, W. Va.: Gerald Kelley (left), superintendent; Brooks Allen, general mine foreman; John Toth, Frank Stuper and Vernon Loy, section foremen.

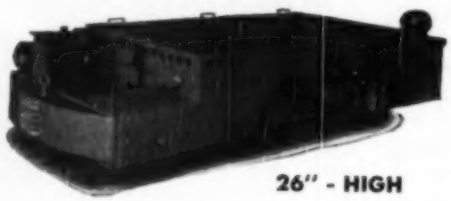
pillar, has been named managing director of the new firm. He will be aided by Wayne H. Becker, parts control manager, as merchandise manager of the subsidiary, and Wayne R. Thomson, planning staff engineer, heading the technical and inspection department.

Quimby Pump Div., H. K. Porter Co., Inc., has been sold to Warren Steam Pump Co., Warren, Mass. In making the announcement, Porter's President, T. M. Evans, explained that Warren was well equipped to handle the servicing of Quimby pumps, and that Porter was withdrawing from the manufacture of screw pumps to devote itself more fully to its other lines of business.

Ideal Industries, Inc., Sycamore, Ill., has acquired the Pyramid Products Co., manufacturers of wire-stripping equipment. Pyramid's E-Z wire stripper will be added to Ideal's line and all manufacturing and sales activity will be moved to Ideal's Sycamore plant.

ATLAS

STORAGE BATTERY LOCOMOTIVES
are more efficient than
any other • • S-B Locomotive



TYPE - F
3-TON
26" - HIGH

GUARANTEED:—TO DO MORE WORK ON ONE CHARGE OF THE BATTERY THAN ANY STORAGE BATTERY LOCOMOTIVES OF THE SAME WEIGHT AND BATTERY CAPACITY.

ATLAS ENGINEERING SERVICE — IS ALWAYS AT YOUR SERVICE

Complete details and specifications on request.

THE ATLAS CAR & MFG. CO.
ENGINEERS — MANUFACTURERS

Illinois Mine Claims New Coal-Loading Mark

A 17-man crew Aug. 24 loaded 1,482 tons of coal in one portal-to-portal shift at the Green Diamond mine of the Mid-Continent Coal Corp., Marissa, Ill., setting what the management believes to be a new world's record for loading with one loading machine and two shuttle cars in room-and-pillar mining.

The crew is headed by Matt Pickford, section foreman. Arthur S. Macke is superintendent of the mine and Martin Barber is mine manager.

Mr. Macke said that the crew, which had been consistently turning in good tonnage, had decided to try for a record that day. "Using a Joy loader, the shift loaded 238 shuttle cars and in doing so cleaned up 41 working places," he reported.

"We think that the men turned in a new record for the room-and-pillar method of mining," he stated. "And if it is proven that it is not a new record, the men will try again. The 1,482 tonnage figure is a tremendous total and the management of the mine is mighty proud of the shift.

MORE LUMP COAL

. . . from these dependable Du Pont Permissibles

Coal mine operators continually report higher lump coal yields from these Du Pont Permissibles.

In thick seams—"Monobel" AA . . . world's largest selling permissible. It shears clean, both at the back and on the ribs . . . sets the cut out in perfect position for mechanical loading . . . has water resistance ample for any coal-shooting job.

In medium seams—"Lump Coal" C . . . strong but very slow. It has a minimum of shattering effect . . . and a spreading action so good that the number of holes can usually be reduced.

In thin seams—"Monobel" E . . . bulky and slow. It strings out the charge . . . pulls the entire depth of the cut.

One of these three permissibles should give you the lump coal you've been looking for. Talk to your Du Pont explosives representative. He'll be glad to tell you more about them and about others that may be better suited to your particular needs. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

DU PONT PERMISSIBLES

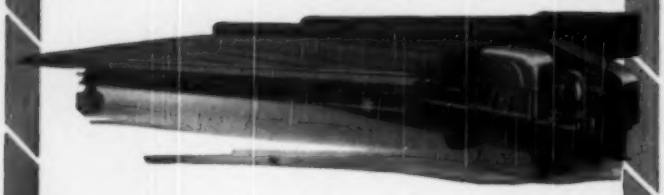
Blasting Supplies and Accessories

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Deal Yourself In with a *SuperDuty* Deck



You're "in" for more profitable play in the game of coal preparation when you deal with a SuperDuty Diagonal Deck.

This efficient Coal Washing Table is a winner every time — the diagonal design of the deck leads with 75% more working riffles to improve your economic score in the fine coal washing game. That means higher quality washed coal products and less coal lost in the refuse . . . higher efficiency and lower costs. Contributing also to this winning hand are the balanced head motion and the factory aligned, synchronized deck action. Maintenance is at a minimum and you are ahead with longer life and reduced operating costs.

For complete information about this winning deal, ask for Bulletin 119.

CONCENCO SPRAY NOZZLES

These handy nozzles are simple, flexible and economical. All you do is drill your holes, clamp on and get results. They can be definitely aligned for washing, sluicing or spraying according to need. They are removed or replaced in a moment's time.

THE DEISTER ★ CONCENTRATOR COMPANY

900 Glasgow Ave. • Fort Wayne, Ind., U.S.A.

CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*

Sorry . . . Wrong Initials

IN THE DESCRIPTION of the bridge conveyor at Crichton No. 4 mine, Johnstown Coal & Coke Co., Nettie, W. Va. (August Coal Age, p 70), the wrong initials were published for E. P. Reed, maintenance engineer, whose photo appears above. Therefore, this notice to set the record straight and express the regrets of the editors.

which has been consistently turning in high tonnage figures."

The previous record reported for one loading machine and two shuttle cars was that of 1,466 tons attained by a crew at Mine No. 207, Consolidation Coal Co. (Ky.) (*Coal Age*, December, 1947, p 116). In 1948, a crew at Mine No. 63, Consolidation Coal Co. (W. Va.) loaded 1,536 tons in one shift, but used three shuttle cars (*Coal Age*, October, 1948, p 126).

Anthracite Stockpiling Progresses in House

A proposal calling for government stockpiling of 10,000,000 tons of anthracite annually for a 5-yr trial period was approved by a Subcommittee of the House Public Lands Committee Aug. 31. The bill, which was introduced by Rep. Flood (D., Pa.), was not expected to be acted on by the full committee for several weeks.

The plan was opposed by the Department of the Interior, on the basis that it would be too costly, would not remedy the industry's troubles and would actually serve to disrupt its business. Although the bill provides for sales at current market prices, the government would have to stand the costs of stockpiling, handling and transportation, it pointed out. During interruptions in normal coal supply, the stockpile would be a matter of controversy, and if used during contract negotiations would lead to complaints that the government was using it as a pressure against labor, it maintained.

"The very existence of such a large stockpile could have a strong influence on market prices; and whatever coal

ALL ROPES *look* ALIKE... but

What has grain size of steel to do with longer rope life?

Plenty!

That's because in every commercial grade of wire rope, there's a certain critical grain size that gives highest resistance to bending fatigue. In Wickwire Rope we make sure that you get this definite grain size and that it is always uniform to exacting McQuaid-Ehn* standards.

Only a fully integrated company like Wickwire can give you this big advantage... because such control of grain size is possible only where all phases of manufacture are under constant check and test... starting with the melting and refining of the steel and continuing through heat-treating processes and cold drawing of the wire.

Here again—Wickwire goes "beyond specifications" to give you assurance of wire rope that can't be beat for reliability, safety and longer life.

*For detailed information on the McQuaid-Ehn test, write to our Sales Office, at Palmer, Mass.

LOOK FOR THE YELLOW TRIANGLE ON THE REEL

Automatic heat control in our patenting or heat treating furnace operates within such close limits that the temperature in the furnace never varies more than a small fraction of one per cent.

WICKWIRE ROPE

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass. EXECUTIVE OFFICE—500 Fifth Avenue, New York 18, N.Y.

SALES OFFICES—Abilene (Tex.) • Boston • Buffalo • Chattanooga • Chicago • Denver • Detroit • Emlenton (Pa.) • Philadelphia • Phoenix • Salt Lake City Tulsa • Odessa (Tex.) • Houston • New York

PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

MORRIS TYPE "R" SLURRY PUMP has 72 different combinations of nozzle locations . . .

● The suction disc swivels on the hooded bearing frame fit. This means that you can put the suction nozzle in almost any position, including the vertically upward position. This location is particularly convenient if you intend to put the pump directly under a suction tank or chest.

● The shell of the Morris Type "R" Slurry Pump is also simply constructed with extra heavy wall thickness. Its symmetrical shape permits either right or left hand rotation. By swiveling on the suction disc, you can get eight different positions of the suction nozzle.

Other features of the Morris Type "R" Slurry Pump

EASY DISMANTLING

You can renew the impeller and shaft sleeve without disturbing the suction and discharge piping or bearings.

LONGER TROUBLE-FREE OPERATION

The Morris Type "R" does not have internal studs or bolts. The liner is firmly clamped in position, shoulder-fit between disc and shell.

ALL-TIME LOW IN STUFFING BOX MAINTENANCE

The Morris Type "R" takes its suction from the drive side only. Equally reliable under high suction pressure . . . high vacuum and high suction lift.

FOR MINING OPERATIONS

The Morris Type "R" Slurry Pump handles all types of mixtures containing abrasive solids and chemicals in suspension, including acid slurries and sludges . . . and slurries containing soda ash, ore concentrates, tailings, slag, coal, etc.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Branch Offices in Principal Cities

MORRIS *Centrifugal Pumps*

MEETINGS

- Coal Producers' Association of Illinois: annual meeting, Oct. 10, Springfield, Ill.
- Kanawha Coal Operators' Association: annual meeting, Oct. 19, Kanawha Country Club, Charleston, W. Va.
- National Safety Council: 38th National Safety Congress and Exposition, Oct. 16-20, Chicago.
- Coal Division, AIME, and Fuels Division, ASME: joint meeting, Oct. 23-25, Statler Hotel, Cleveland, Ohio.
- Kentucky Mining Institute: annual meeting, Nov. 10-11, Lexington, Ky.
- Illinois Mining Institute: 58th annual meeting, Nov. 17, Hotel Abraham Lincoln, Springfield, Ill.
- W. Va. Coal Mining Institute and Central Appalachian Section, AIME: joint meeting, Nov. 24-25, The Greenbrier Hotel, White Sulphur Springs, W. Va.

went into the market from the stockpile could mean that much less current work for the miners," the department said.

The measure was supported by several Pennsylvania Congressmen and by Frank W. Earnest Jr., president of the Anthracite Institute. Mr. Earnest said that the bill would help solve the immediate problems of the industry by building up a backlog of critical sizes and holding mine labor. Unless anthracite producers can offer "fuller employment under present and probable future emergency conditions, there will be serious difficulty in holding their men in the anthracite region," he said. Thomas Kennedy, UMWA vice president, also testified for the plan.

A bill to authorize government stockpiling of bituminous coal "in amounts sufficient to maintain normal production and employment" has been introduced into the House by Rep. Staggers (D., W. Va.)

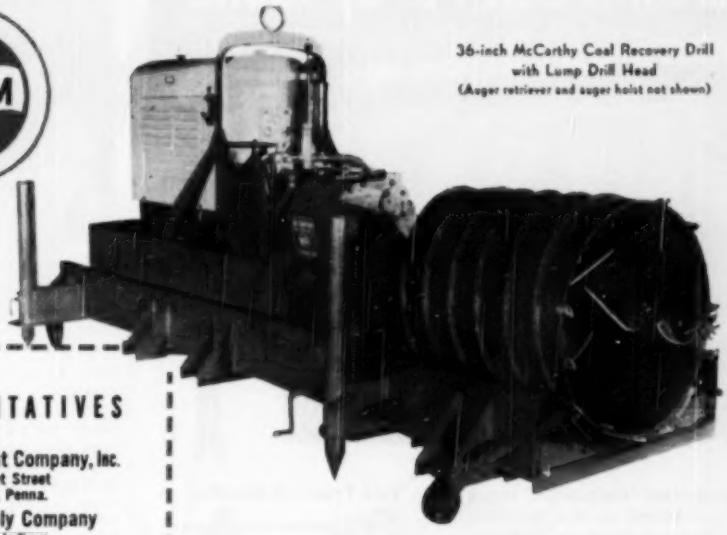
The bituminous coal industry wants no part of the proposed measure, John D. Battle, executive vice president, NCA, recently told the House committee. "We utterly oppose any such programs as being unsound, unnecessary and uneconomical. . . . We see no necessity to waste the time of Congress or the industry on this bill," he said.

Anthracite Institute Adds 16 Heating Consultants

Twelve new fuel and heating consultants have been added to the staff of Anthracite Institute for the expanded consumer service program which will be an important part of the industry's record new promotional campaign for 1950, M. R. Grover,

12 to 50 tons per man per shift with *LOW INVESTMENT COST*

SALEM



36-inch McCarthy Coal Recovery Drill with Lump Drill Head
(Auger retriever and auger hoist not shown)

REPRESENTATIVES

Capitol Equipment Company, Inc.
1134 Market Street
Harrisburg, Penna.

Diamond Supply Company
Evansville, Indiana

A. T. Green Machinery Co.
Box 8538
Pittsburgh 23, Penna.

Mine and Contractors Supply Co.
930 Second Avenue
Birmingham, Alabama

Nixon Machinery Company
Carter at 13th Street
Chattanooga, Tenn.

O. Philipp & Company
(Export Agents)
19 Rector Street
New York 6, New York

Rish Equipment Company
Box 1260, Richmond, Va.
Box 353, Charleston 22, W. Va.
Clarksburg, W. Va.
Box 1369, Roanoke, Va.
Box 269, Bluefield, W. Va.

Union Supply Company
1401 Wazee Street
Denver 2, Colorado

W. W. Williams Company
835 Goodale Blvd.
Columbus 8, Ohio

R. A. Young & Son, Inc.
301 So. 10th Street
Fort Smith, Arkansas

● Many successful mine operators credit McCarthy Coal Drills with tremendous new savings in time and money.

Recent reports from the Coal Salvage Company show that, with a 36-inch auger, the powerful McCarthy unit, running almost maintenance free, delivers 130 tons of coal during each 7¼-hour shift for an average daily rate of 32½ tons for each of the 4-man crew.

With a 24-inch auger and a 3-man crew, average daily output amounts to 55 tons or 18½ tons per man.

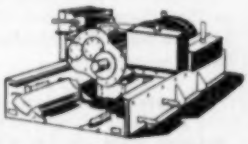
The versatile McCarthy Coal Drill has plenty of extra power for handling 12, 16, 20, 24, 30 and 36-inch diameter auger sections with a smooth, steady bore that penetrates to almost any depth.

McCarthy Coal Drills can be equipped with electric, gasoline or diesel motors for both deep mine and stripping operations.

Write today for the full story on this remarkable new money-maker.

Lump Coal Recovery Drill Head

Coal Recovery in Highwall



Underground Coal Recovery Drill

THE SALEM TOOL COMPANY
349 SOUTH ELLSWORTH AVENUE SALEM, OHIO, U. S. A.

SAFE, EFFICIENT ROOF CONTROL
with SIMPLEX Pin-up Jacks

When temporary support of cross timbers is needed at the working place, you can depend on Simplex Pin-Up Jacks to do the job — with positive safety, and without interfering with work.

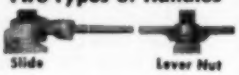
The forked base slips securely onto pins set in the rib. It can't slip out, yet there is no interference with loading machines. Head of Jack sets securely against supporting timber.

These Jacks save productive time because they are quickly set into place and are easily adjustable to varying roof heights. Simplex engineering has given them a foolproof mechanism plus rugged construction. With them, you avoid needless dangers of ordinary supports.

Available in 8 and 16 ton capacities — complete with square tubing (1½" or 2½" diam.), or with fittings alone for use with 2" standard or extra heavy round pipe.

COMPLETE SPECIFICATIONS AND PRICES AVAILABLE IN: "SUPPLEMENT TO BULLETIN MINES 47" — Send for it Today!

Two Types of Handles



Slide Lever Nut

SIMPLEX
Ratchet Lowering
MINE JACKS

Use these Safety Speed Ratchet Lowering Jacks — 5 to 35 tons cap. — for all purpose jacking with cutting and loading machines, rerailing mine cars, shop and track work. All models lift full capacity on cap or toe — an exclusive Simplex feature.

86A For Thick Seams
85A For Medium Seams
84A For Thin Seams

Simplex
LEVER • SCREW • HYDRAULIC
Jacks

TEMPLETON, KENLY & CO.

1040 S. Central Ave., Chicago 44, Illinois

COAL MEN ON THE JOB

CANNELTON COAL & COKE CO., Lady Dunn No. 100 mine, Cannelton, W. Va.: J. S. Kern (left), mine foreman; and John DeFrank, assistant mine foreman.

institute vice president announced recently.

With the 12 new consultants already in the field, four additional men were expected to complete their training early last month. The new institute staff, which will ultimately total 16, will supplement the activities of the regular field representatives, specializing in the commercial building field. They will be stationed in various major anthracite-consuming areas.

Pennsylvania R. R. Orders 214 Diesels; Erie, 57

The Pennsylvania R.R. early last month announced purchase of 214 diesel-electric locomotives, at a cost of $55,000,000. The order includes freight and passenger locomotives, as well as switchers, and is thought to be largest order ever placed by any one railroad. Delivery is scheduled to be completed by next June.

Last November the Pennsylvania ordered 226 diesels and practically all of these are now in service, it was reported. Walter S. Franklin, president of the railroad, said that the latest order came after a study of the road's present and future requirements. For a number of trains now powered by steam locomotives, "the economies inherent in dieselization compared with steam power are not sufficient to warrant the investment in diesels," he said. "For this reason we intend to continue the use of steam power where it is economically justified."

The Erie R.R. also announced purchase of 57 diesel units, at a cost of about $11,000,000. On delivery of these locomotives, which constitute the largest single purchase of diesels by the Erie, the road will be 95% dieselized, Paul W. Johnston, president, reported.

For CLEAN Gear Oil...

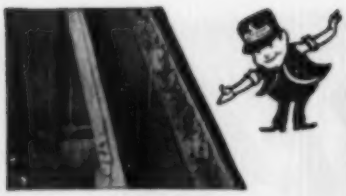
Equip your transmissions with inexpensive Fuller Transmission Oil Filters—easily installed on all Fuller Transmissions and most other makes. The new Fuller Filter keeps gear box oil clean between changes. Normal pressure of rotating gears forces the oil through a cleansing filter element and returns it to the gear box. Clean oil saves wear and tear on moving parts—saves you money on parts, labor and down-time. Write for more information.

$6.95 LIST PRICE

Fuller FILTER

FULLER MANUFACTURING COMPANY Transmission Division, KALAMAZOO 13F, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wis. • WESTERN DISTRICT OFFICE (SALES & SERVICE—BOTH DIVISIONS), 1060 E. 11th Street, Oakland 6, Calif.



This User says:

Belt Joints now in 7th month joined with

CRESCENT BELT FASTENERS

Yes, this Conveyor-belt joining had to be renewed every 3 weeks —UNTIL Crescents were used. The Crescent Fasteners had been in use 7 MONTHS when photographed, with no noticeable signs of wear. It's the same story wherever Crescent Belt Fasteners are used—Belts handling ore, coal or rock—belts under terrific strain—are joined with Crescents; and the fastening is good for the life of the belt. There's a size and type of Crescent Plates and Rivets for every type and size of flat belting and pulleys for conveyor, transmission or elevator belting. Strong, smooth, noiseless, economical, safe, long lasting. Used in all industries over the world. For complete details, service charts of sizes, etc., write or phone nearest office today.

Outside

Pulley side

CRESCENT BELT FASTENER COMPANY

Clinic Studies Coal-Mine Lighting Problems

The country's first coal-mine lighting clinic was held Aug. 22 at the Nela Park headquarters of General Electric lamp department in Cleveland. Chief purpose of the all-day conference, which was sponsored by the National Coal Association, was to highlight the various seeing problems of coal miners and provide solutions. Some 26 representatives of various branches of the coal mining industry attended.

"The clinic," according to G. F. Prideaux, GE mine-lighting engineer and chairman of the conference, "was beamed at improved seeing conditions to be achieved through intelligent application of new scientific knowledge in this field. Lamps, lighting and rock dusting," he pointed out, "are among the means to such sought-for goals in coal mines as increased safety, improved production efficiencies and more cheerful surroundings."

Speakers on the program were: Earl R. Maize, director, NCA Safety Div.; E. J. Gleim, supervising engineer, USBM, Pittsburgh; M. H. Forester, Pittsburgh Consolidation Coal Co.; Robert J. Condra, assistant safety director, UMWA; Arthur A. Eastman, Howard M. Ferroe, and Elton A. Linsday, Nela Park lighting engineer; and Cory M. Crysler, GE lamp department, Pittsburgh.

Following a discussion of the means to secure the cooperation of responsible groups in achieving the clinic's objectives and a tabulation of the problems involved, the group sat down to a "round-table" dinner discussion.

Those attending the clinic, as shown in the photograph above, were: Top row—C. M. Crysler (left), GE; J. E. LeBanc, T. C., I. & R.R. Co.; A. J. Alexander, chief, W. Va. Dept. of Mines; C. M. Donahue, Mine Safety Appliances Co.; A. D. Sisk, chief, Kentucky Dept. of Mines and Minerals; E. J. Coggeshall, USBM; James C. Smith Jr., Appalachian Electric Power Co.; Ernest Rost, Thomas A. Edison, Inc.; G. B. Southward, American Mining Congress; and M. H. Forester, Pittsburgh Consolidation Coal Co.

Middle row—P. L. McClure (left), GE; L. J. Timms, The Tierney Co.; Ray Light, National Mine Service Co.; E. R. Maize, NCA; E. E. Lay, GE; Frank R. Hugus, Joy Mfg. Co.; H. B. Buckingham, T. C., I. & R.R. Co.; R. B. Moore, GE; Robert E. Havener, Mine Safety Appliances Co.; and J. A. Keyser, BCR.

Front row — Stephen Williams (left), Ohio Div. of Mines; Graham Bright, Mine Safety Appliances Co.;

KERSEY MINE TRACTOR MODEL 444

This battery powered mine tractor has 4-wheel drive — 4-wheel steering — 2-wheel mechanical brakes. It is an ideal tractor unit for pulling trailers for hauling coal, supplies and personnel . . . The four-wheel drive provides maximum drawbar pull under all conditions . . . Two driving motors are used, each powers one axle by roller chain and full differential action is provided . . . Machine is only 24 inches high with ample deck space to operate safely in seams as low as 28 inches. Sturdy—powerful—it will be equipped with batteries to meet your operating conditions.

Full descriptive bulletin containing specifications and other operating data is available. Write for your copy today.

KERSEY MANUFACTURING COMPANY
Battery Powered Mine Equipment
BLUEFIELD, VIRGINIA

BIG DIPPER

ONE BITE—and this world's largest power shovel—at the Hanna Coal Company's Georgetown, Ohio, mine—strips off enough overburden to fill the living-room of an average American home! The bucket holds 45 cubic yards—can be swung two-thirds of a city block to dump its load.

This one machine has all the complicated lubrication problems of a factory...requires a complete lubrication program to maintain peak efficiency. Socony-Vacuum was entrusted with this job...supplies the right grease for those cable sheaves... the right hydraulic oils for those giant jacks...the right lubricants for those swing, crowd, and crawler gears...other lubricants for all machinery inside.

You, too, can get such a program of *Correct Lubrication* —backed by our 84 years' experience. Just call your Socony-Vacuum Representative.

Gets the World's Greatest Lubrication Knowledge and Engineering Service

Illustration prepared with the cooperation of Marion Power Shovel Co.

SOCONY-VACUUM

Correct Lubrication

SOCONY-VACUUM OIL CO., INC.
and Affiliates
MAGNOLIA PETROLEUM COMPANY
GENERAL PETROLEUM CORP.

ROCK RATED!

THE NEW **P&H** MODEL 955-A (2¼ YDS.)

with *MAGNETORQUE** swing

Watch this new machine get its teeth into a rock job and see what "rock-rated" really means to you. It's *designed* . . . every inch from boom point to crawler shoes . . . to make rock handling easier . . . more profitable for you.

Unbeatable—point for point

P&H Magnetorque eliminates swing friction clutches . . . their troubles and replacement costs. It gives you smoother, faster swings . . . for the life of your machine.

Greater Stability gives you more power at the tooth point . . . and greater work capacity.

Direct Acting Hydraulic Control . . . easier on machine, easier on operator . . . smoother and greater holding power through full wrap brakes and clutches.

*Trade-Mark of Harnischfeger Corporation for electro-magnetic type clutch.

P&H Rapid Reversing Planetary Chain Crowd gives you snappier dipper action. It's more accurate. And crowd chain outlasts 25 to 30 crowd cables.

Get the facts about P&H all-welded strength and Added Values! The 955A is a 2½ yd. version of the P&H 1055 (3 yd. shovel) . . . the machine that has set new low-cost production records everywhere. Write for Bulletin X122, today.

P&H **EXCAVATORS**
4540 West National Ave.
Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS and ELECTRODES • SOIL STABILIZERS • CRAWLER and TRUCK CRANES • DIESEL ENGINES • CANE LOADERS • PRE-ASSEMBLED HOMES

EQUIPMENT APPROVALS

Eight approvals of permissible equipment were issued by the U. S. Bureau of Mines in August, as follows:

Goodman Mfg. Co.—Types G or GS-12-1/2 shaker conveyors; one motor, 10 hp, 220 and 380 v, ac; Approvals 2-748 and 2-748A; Aug. 4.

Jeffrey Mfg. Co.—Type 76-A Colmol mining machine; three motors, 50 hp each, 250 and 500 v, dc; Approvals 2-749 and 2-749A; Aug. 8.

Joy Mfg. Co.—Type WK83T Model 240 compressor; one motor, 50 hp, 250 v, dc; Approval 2-750; Aug. 14.

Joy Mfg. Co.—Type WK83R Model 240 compressor; one motor, 50 hp, 250 v, dc; Approval 2-751; Aug. 16.

Joy Mfg. Co.—Types 12RB and 12RT coal-cutting machines; two motors, 26 and 50 hp, 250 v, dc; Approval 2-752; Aug. 22.

Joy Mfg. Co.—Type MTB-30 belt conveyor; one motor, 25 hp, 500 v, ac; Approval 2-753A; Aug. 28.

Joy Mfg. Co.—Type TS3-1PE/F timber setter; three motors, one 4 hp and two 7½ hp, 250 and 500 v, dc; Approvals 2-754 and 2-754A; Aug. 30.

Jeffrey Mfg. Co.—Shortwall truck; one motor, 7½ hp, 250 v, dc; Approval 2-755; Aug. 30.

E. J. Gleim, USBM; Robert J. Condra, UMWA; Mrs. Condra; Mrs. Allen; Richard Maize, Secretary, Pennsylvania Dept. of Mines; Thomas Allen, State of Colorado; H. M. Lawrence, American Standards Association; and A. L. Barrett, Joy Mfg. Co.

AIME Coal Division Grants Scholarships

Three scholarships designed to help the recipients prepare themselves for a career in the coal industry have been announced by the Scholarship Committee, Coal Division, AIME. The young men are expected to gain actual mining experience during vacations.

Paul I. Osborne, Mt. Pleasant, Ohio, received a scholarship in coal-mining engineering at the University of Ohio, valued at nearly $2,000. He is the son of the pastor of the Friends' Church in that community and was recommended by officials of The Hanna Coal Co.

A grant, valued at nearly $1,500, for study at the Johnstown Branch of the University of Pittsburgh was made to John Wisniewski, of Portage, Pa. Mr. Wisniewski graduated last June with an excellent record as one of 54 students in coal mining.

Frank Armstrong, employed by the Consumers Mining Co. and a graduate of the Springdale (Pa.) High School, will study mining engineering at Penn State. His father was for many years chief clerk at the Hamar mine.

HINGED PLATEGRIP
BELT FASTENER No. 500
FOR HEAVY CONVEYOR BELTS OF CHANGING LENGTH

These heavy-duty belt fasteners make a strong, flexible joint in conveyor belts, belts of any width and of from ⅜" to ½" thickness. They offer special advantages in mines, quarries or industrial set-ups where length or position of belt is frequently changed, because sections can be removed or added at will. Joints are opened for this reason by simply pulling out the hinge pin.

Easily and quickly applied on the job or in the shop. Special design gives deeper compression into belting and smooth, flush joint.

Write for Circular

ARMSTRONG-BRAY & CO.
5340 Northwest Highway . CHICAGO 30, U.S.A.

CONTROL Your Water Problems with the *Flood City* PLUNGER PUMP

Power end is made of ni-tensile semi-steel with a large cover to facilitate inspection. All moving parts are completely self-lubricating. Intermediate shaft runs on adjustable roller bearings. Furnished V-Belt or Gear Drive. Size 3 x 5, Capacity, 80 gals. per minute, 2" suction and 1½" discharge.

This pump uses the leak-proof, cold-resistant FLOOD CITY REVERSIBLE WATER END—standard for replacement purposes in large and small coal mines. Write for more information on this and other Flood City mining equipment.

Flood City Brass & Electric Co.
Manager and Elder Streets . JOHNSTOWN, PA.
Branch Office: 9 Virginia St. W., Charleston, W. Va.

MORE HAULAGE FOR 20% LESS BATTERY CAPACITY

GREENSBURG "MONITOR"

Franklin County Coal Corporation at Royalton and Herrin, Illinois, have 12 of our Monitor type, storage battery locomotives.

All Greensburg Locomotives are CUSTOM-BUILT *to your requirements*

THE GREENSBURG MACHINE CO. 101 STANTON ST. GREENSBURG, PA.

Tuffy

Magic Word In Rope Buying

You don't have to be a magician—or even a mathematician—to order, stock or install any member of the Tuffy family of special purpose wire ropes. To get all the Tuffy advantages just say or write "TUFFY!" to your Union Wire Rope distributor—plus the size, length and type of Tuffy you require. Designed for the toughest jobs, Tuffy special purpose wire ropes will give longer service, handle more yardage or tonnage at a lower ultimate cost.

Tuffy SCRAPER ROPE Test Tuffy's ability to handle extra yardage on the toughest scraper jobs. You'll change to Tuffy on your whole fleet!

Tuffy DRAGLINES Put Tuffy Draglines to any test. Watch them come out on top with unequalled money-saving records. To order just specify length, diameter and "Tuffy"!

Tuffy SLINGS An entirely different, patented, interlaced wire fabric construction gives Tuffy Slings extraordinary stamina and flexibility. Factory Fitted.

Tuffy CHOKER Wire rope specially stranded and socketed for extra strength, stamina, flexibility required in logging.

union Wire Rope corporation

2130 Manchester Ave., Kansas City 3, Mo.

Send information on:
Tuffy ☐ SCRAPER ROPE ☐ DRAGLINES ☐ SLINGS ☐ CHOKERS

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ADDRESS_____

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Promise or
Performance?
COAL
HEATING
SERVICE
Coal Never Lets You Down...
It's the most dependable fuel in the world for home heating.
Coal is always available . . . and you can get it from not just one source but many . . . it's the only fuel you can store ahead of your needs.
Coal gives you the extra heat you want on the coldest days . . . your heat supply isn't reduced just because others are using more at the same time.
Yes, Coal gives Performance, not just a Promise. Coal is your fuel for Comfort—it's plentiful, it's safe, it's dependable. Order yours today from your Coal Heating Service retailer.
24-Hour Service!
PHONE 0000
COAL
HEATING
SERVICE
OF YOUR COMMUNITY
for better home heating

New Salesman Plugs Bituminous Coal Heating

A new cartoon character, "Mr. Steady Heat," will emphasize the many advantages of bituminous coal and Coal Heating Service in domestic markets throughout the nation during the coming year. Originated by Frank A. Ernst, executive secretary, CHS of Milwaukee, Inc., Mr. Steady Heat is a new feature of the advertisements in the Coal Heating Service fall and winter newspaper advertising book, which will be used by the 79 CHS groups throughout the country.

A definitely competitive tone marks the CHS fall and winter advertising. The ads being made available to local retailer groups are packed with "sell" on coal and coal-burning equipment. Each ad appeals to a consumer's buying motive and contrasts the advantages of coal heat with other fuels.

During the first 6 mo of this year, CHS groups sponsored more than 395 million advertising messages. They used 125 newspapers, radio and television, bus cards and billboards. An even greater volume of advertising is expected during the coming heating season.

New "Alphabet Agencies"

Defense mobilization is bringing forth a new set of "alphabet agencies," which although somewhat similar in functions to those of World War II, have new names to be remembered.

Instead of the OPA, there is the ESA (Economic Stabilization Agency). Priorities for scarce materials will come from the NPA (National Production Agency), rather than from the WPB. The NSRB (National Security Resources Board) will handle manpower, instead of the War Manpower Commission.

Get a better day's work out of your Truck Dollar

CHEVROLET TRUCKS

CHEVROLET

You invest money in a truck to *get work done.* And you can prove to your own satisfaction that a Chevrolet truck does more work for every dollar you put into it.

You get *more for your money* right from the start, because your Chevrolet truck is priced at rock bottom. Chevrolet volume production—far and away the biggest in the truck field—makes possible extra features and extra engineering advantages at lowest cost.

You get *more for your money* every driving mile, because Chevrolet trucks are economical to operate. The top-rated efficiency of Chevrolet Valve-in-Head engine design saves money on gas and oil day in, day out.

You get *more for your money* right through the years, because your Chevrolet truck cuts upkeep to the bone. Hypoid rear axles, diaphragm spring clutch, ball-type steering and many other great truck features help keep your truck on the job and out of the shop.

Get the full "more-work-per-dollar" story from your Chevrolet dealer—and get America's biggest selling, best performing truck: Chevrolet.

CHEVROLET MOTOR DIVISION, *General Motors Corporation*
DETROIT 2, MICHIGAN

These Great Features Help Tell Why
CHEVROLET TRUCKS ARE THE FIRST CHOICE OF TRUCK BUYERS EVERYWHERE

TWO GREAT VALVE-IN-HEAD ENGINES: the new Loadmaster and the improved Thriftmaster—to give you greater power per gallon, lower cost per load • THE NEW POWER-JET CARBURETOR: smoother, quicker acceleration response • DIAPHRAGM SPRING CLUTCH for easy-action engagement • SYNCHRO-MESH TRANSMISSIONS for fast, smooth shifting • HYPOID REAR AXLES—5 times more durable than spiral bevel type • DOUBLE-ARTICULATED BRAKES—for complete driver control • WIDE-BASE WHEELS for increased tire mileage • ADVANCE-DESIGN STYLING with the "Cab that Breathes" • BALL-TYPE STEERING for easier handling • UNIT-DESIGN BODIES—precision built.

SHUTTLE CAR RESISTORS

Illustrated, GUYAN replacement elements for permissible shuttle-car traction motors . . . fits in original case and mountings. Resistor available for all type shuttle car traction and reel motors.

GUYAN Try us for long-lived, trouble-free resistors.

MACHINERY COMPANY

LOGAN, WEST VIRGINIA

News in Brief

Miner Works 66 Yr Without an Accident

CROWNED "KING SAFETY" at the Pioneer Safety Miners Reunion in Bluefield, W. Va., Aug. 19 was A. C. Nelson, 83, of Boissevain, Va., who before his retirement worked 66 yr in coal mines without an accident. The reunion, a regular feature of the Southern Appalachian Industrial Exhibit, attracted a large number of veteran miners, 47 of whom had worked for 50 yr or more without a lost-time injury. At the right is Miss Glenna Bearden, of Vivian, W. Va., who served as "Queen Bituminous" during the Bluefield Show.

solution... FOR LONGER CABLE WEAR!

It's no mystery why Ruberoid Insulating Tape has led in the cable maintenance field for more than half a century! Only Ruberoid gives you *all* seven of these big, cost-cutting features.

- Double grip . . . both sides adhesive
- Great tensile strength . . . tough
- Won't tear, ravel or pucker
- Resists abrasion
- Acid- and alkali-proof
- Extra thick . . . one layer insulates

• Exceeds A.S.T.M. specifications by 300% in adhesiveness, 26% in tensile strength, 290% in dielectric strength.

QUALITY BUILDING MATERIALS AND INDUSTRIAL SPECIALTIES

The RUBEROID Co.

EXECUTIVE OFFICES:
500 Fifth Avenue, New York 18, N. Y.

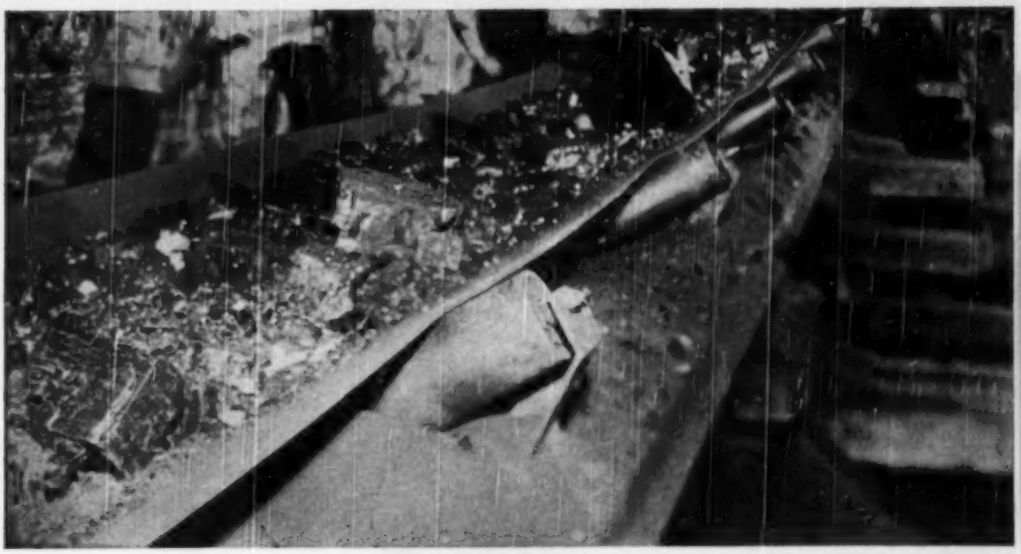
Steel Workers Seek Pay Rise

The CIO Steelworkers union Sept. 21 asked the steel industry to open negotiations for higher wages Oct. 9, some 7 wk ahead of the opening of wage talks as provided in the contract signed last year. The request for talks came as the Aluminum Co. of America notified the CIO group and eight other unions that it was prepared to grant a voluntary wage boost of 10% to its 40,000 workers, effective Sept. 2. CIO President Philip Murray told the steel companies that "the national interest" made it essential that a wage agreement be made "at the earliest possible date" but promised that the union would try to prevent strikes until Jan. 1 as the contract provides. Labor shortages will make it difficult to hold skilled workers without a pay hike, he said.

Attorney Sues Welfare Fund

William L. P. Burke, a Washington attorney, has sued John E. Lewis, Sen. Bridges and Ezra Van Horn to obtain a fee of $50,000 for defending them as trustees of the UMWA Welfare and Retirement Fund in two court cases. Mr. Burke, who was retained by the Fund in 1947, said his suit was "especially" aimed at Mr. Lewis, who, he said, "summarily discharged" him last May 11. He states that he was to be paid for defending the Fund in the case brought by a former Uniontown miner, which is still pend-

NEW 4-PLY UNDERGROUND COAL BELT HAS RUGGED STRENGTH AND GREATER FLEXIBILITY



Here's the remarkable new 4-ply U. S. Giant Underground Coal Belt that's every bit as rugged as United States Rubber's 4-ply 42 oz., but with greater crosswise flexibility.

This belt is available in two styles:

Style XN has a working tension strong enough to handle all known belt requirements except extremely long center installations.

Style YN incorporates the additional strength required by extremely long center installations in use or planned.

Outstanding features of this remarkable belt include: OPTIMUM CROSSWISE FLEXIBILITY, providing excellent troughing and easy training, eliminating edge wear and spillage. CROSSWISE STRENGTH, to resist gouging and tearing. ONE TYPE FABRIC CONSTRUCTION, to equalize tension and elongation throughout the belt. ELASTICITY, to cushion shock loads and impact, prevent localized strain. FASTENER HOLDING STRENGTH comparable to United States Rubber Company's 4-ply 42 oz., which hitherto has been considered outstanding in this respect. HIGH STRENGTH AT LESS WEIGHT facilitates transportation of belt in underground locations.

For more information write Mechanical Goods Division, United States Rubber Company, Rockefeller Center, New York 20, N. Y.

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Complete MINING FACILITIES
PREPARATION PLANTS
REVERSIBLE FANS
BICYCLE TYPE SHEAVES
SLATE LARRIES
ELECTRIC HOISTS
LET CONNELLSVILLE HANDLE YOUR COAL
From Mine Car to Railroad Car
For almost 50 years, Connellsville Equipment has been foremost in providing the most efficient, complete means of moving coal from the mine car to railroad car, both in the United States and foreign countries. Designed and sturdily-built for rugged, safe operation—Connellsville Equipment can do a maintenance-saving job for you. Why not write for details today!
In addition to the shaft equipment shown, we also manufacture haulages and belt conveyors for slope or drift mining, as well as these trade name products—LEPLEY HOISTING EQUIPMENT, FORT PITT CAR-CAGING EQUIPMENT and YOUGH PUMPS. Consult your McGraw-Hill Mining Catalogue.
ROTARY DUMPS
MINE CARS
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CAR SAFETY HORNS
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ing, and in the suit brought by Judge Charles I. Dawson, which was dropped on signing of the 1950 wage contract.

Howard Leaves Munitions Post

The resignation of Hubert E. Howard, former Chicago coal executive, as chairman of the Munitions Board of the Department of Defense was accepted by President Truman Sept. 18. Mr. Howard submitted his resignation the day after the resignation of Louis Johnson, telling the President that "when I came to Washington last fall at the request of Mr. Johnson, I promised him I would spend a year in government service. That year has expired Sept. 1."

NLRB Rejects UMWA "Front Man"

The NLRB last month rejected what it called an attempt by the UMWA to use its facilities without complying with the non-Communist provisions of the Taft-Hartley Act. It found that a miner, Albin Becker, was "fronting" for the UMWA in asking the NLRB to conduct an election among the 130 employes of the Knife River Mining Co., Beulah, N. D., to determine whether they no longer wished to be represented by the PMA. The board said Becker was a member of the UMWA and had been represented by an attorney he had not hired and did not intend to pay.

And for the Record . . .

The Senate Interior Committee was authorized Sept. 18 to go ahead with an investigation of the national fuels situation and recommend a national policy, when the Senate defeated a motion by Sen. Thomas calling for reconsideration of the resolution setting up the study (*Coal Age*, September, p 182).

The 1946 Centralia mine explosion will be made into a Hollywood film, according to an announcement by a new independent firm organized to make the film. The article in *Harper's* magazine describing the disaster will be used as the basis of the film.

Members of the Indiana Coal Producers Association this year have planted 1,430,000 seedlings on 2,015 acres of stripped land, it was recently reported. Non-member operators planted another 81.3 acres.

There will be no coal shortages within at least the next 3 yr, but car shortages may retard the prompt distribution of coal, members of the National Bituminous Coal Advisory Council told Secretary of the Interior Chapman at a meeting in Washington Sept. 13. The industry can supply full-scale mobilization and "requires no governmental controls until and unless an actual shortage occurs," they said.

NEW EFFICIENT MINE STOPPING METHOD
USES AMAZING G. E. SPRAYABLE PLASTIC FILM

COCOON®

You've heard about our original COCOON—it's the tough, waterproof, acid-proof sprayable plastic that has been used by the Army and Navy to "wrap up" everything from B-29's to battleships.

Now a special version of COCOON—G. E. COCOON, is proving highly useful in mine stopping applications, providing a flexible, continuous seal which can be applied quickly, without special skills. Get the whole COCOON story—write today for details.

HERE'S HOW G. E. COCOON IS USED

- For Temporary or Permanent Stoppings on Brattice Cloth
- For Dry Concrete or Cinder Block Walls
- For Sealing Overcasts
- For Repairs of Cracked Concrete Walls or Broken Overcasts
- For Sealing Off Mine Fires

AND HERE ARE SOME OF THE *BIG* ADVANTAGES OF G. E. COCOON

1. More effective sealing makes ventilating systems more efficient—cuts costs of operating fans and pumps. Controls air flow more efficiently.
2. Saves money by facilitating recovery of stopping materials. (G. E. COCOON can be reused many times).
3. Is absolutely non-toxic—can be sprayed in confined areas without masks using standard spraying equipment.
4. Acid and moisture-proof; will not mildew or rot.
5. Spray equipment includes 2 wheel mobile compressor with explosion-proof motor. Wt. 275 lbs. Dim. L. 26", W. 17", H. 24".

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R. M. HOLLINGSHEAD CORP.
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LEADER IN MAINTENANCE CHEMICALS
Canadian Offices: Toronto
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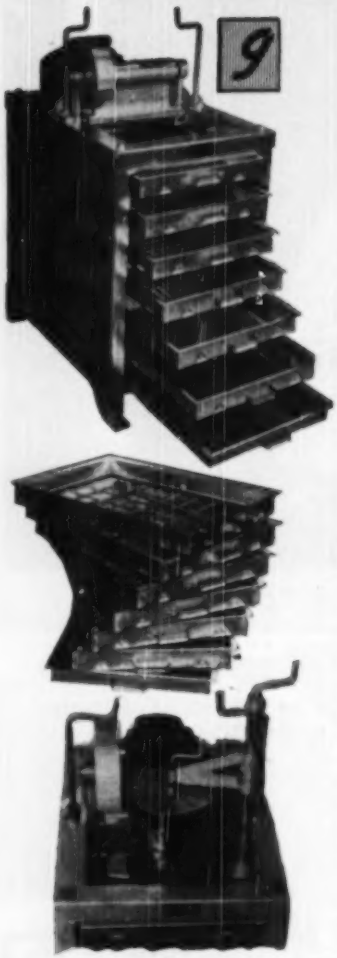
Write for Details

We'll gladly send you recommendations on the use of G. E. COCOON for your special problems, and we will train your picked employees in our Camden spray booth to build G. E. COCOON stoppings.

Now Available to the COAL INDUSTRY with either Round or Square Screen Openings

GILSON *Mechanical* TESTING SCREEN



The GILSON Testing Screen gives you prompt, accurate information about:

1. Your finished product
2. Your raw material
3. Semi-processed material at any stage

Knowing these facts about your product — the fluctuating changes in your operations enable you to operate your plant intelligently and more economically.

This machine is designed for the efficient sizing of test samples. It accommodates samples up to one cubic foot, making from two to seven separations simultaneously, in five minutes or less.

The screen trays and dust pan are sturdy, built to stand rough usage —will not bend or warp. Screen surfaces (ASTM standards) are held under tension by a tightening arrangement which insures proper vibration and permits easy replacement.

As standard screen trays are usually too large for testing very fine materials, an attachment (shown below, left) may be furnished for using eight-inch testing sieves in conjunction with the vibrating unit.

Where exacting specifications are required the Gilson Screen eliminates guesswork — avoids errors and provides facts which reduce operating delays.

For fast, accurate sizing from 4" to 200-mesh specify a Gilson Testing Screen.

GILSON SCREEN CO. BOX 186 MERCER, PENNA.

New Developments

Plans for development of a new 4,000-tpd mine in Washington County, Pennsylvania, and the re-opening of the Collier mine in Fayette County, closed since 1928, have been announced by H. C. Frick Coke Co., U. S. Steel subsidiary. Continuing demand for additional coal to help national defense needs for increased steel was behind the developments, it was said.

The new property, which is scheduled to begin production early in 1952, will be located between Vestaburg and Fredericktown. Construction plans include a river tipple for loading barges to transport coal 42 mi down the Monongahela River to the Carnegie-Illinois Steel Corp.'s by-product plant at Clairton. Construction has begun on a new road leading to the mine, in the Centerville Borough district across the Monongahela from Frick's Maxwell mine. It will be the first mine in that immediate area, known as Brown's Fifth Pool field.

Pumping of water from the Collier mine already has begun as the first step in its rehabilitation and it is expected to be ready for mining operations in about a year. Both surface and underground facilities will be completely revamped and the property also will have a capacity of 4,000 tpd. The mine is in the Fairchance district, near Uniontown, and all coal mined will be coked in adjacent beehive ovens. Mining was discontinued there 22 yr ago in favor of mines with facilities for river shipment of coal to by-product coke plants.

Incorporation of the Viking Coal Co., Terre Haute, Ind., as a wholly owned subsidiary of Walter Bledsoe & Co., was reported last month. The new company will take over operation of the Saxton and Viking mines, formerly operated under the Bledsoe name. No changes in management policy or personnel were to be made. Officers and directors of the new firm are: W. S. Webster, president; Birch Brooks, vice president and general manager; Walter A. Bledsoe Jr., vice president; F. W. Beushausen, secretary-treasurer; and S. R. Evans, assistant secretary-treasurer.

A new washing plant to be installed at the Valier No. 1 mine, Valier, Ill., now being renovated by the Old Ben Coal Corp., will incorporate a heavy media float-and-sink unit built by the Nelson L. Davis Co., according to a recent announcement by R. L. Adams, vice president in charge of operations. The property is expected to resume production some time next year.

Construction of new coal-company facilities for loading coal barges on the Monongahela and Kanawha Rivers recently was announced by the Contracting Div., Dravo Corp., Pittsburgh. At the Mathies mine of the

2 good Rail Bonds

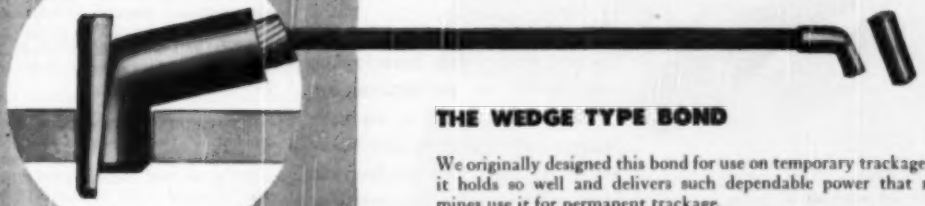
● *built for abuse*

● *easy to put on!*

THE BF-10 BOND

This is the bond for permanent, low-resistance track joints. Strand can be placed either above or below track base.

Here's why it's so easy to install. The BF-10 is a *self-clamping* bond. One hammer blow drives it onto the rail—in position—ready to weld. No special clamps or holding devices are necessary. Because of this quick and convenient self-clamping feature, the bond won't slip off when the welding job is half-finished. Valuable man-hours are saved.



THE WEDGE TYPE BOND

We originally designed this bond for use on temporary trackage. But it holds so well and delivers such dependable power that many mines use it for permanent trackage.

Three hammer blows and it's on to stay. You don't have to weld it. But even though the Wedge Type Bond is very easy to install, it *holds tight*, won't shake loose.

To remove the bond, just hammer the forged steel wedge out from the other side. The bond can then be used over and over again.

EACH of these U·S·S TIGERWELD Rail Bonds is built for many years of service. The wires are electrically butt-welded to the solid terminals. This butt-welded joint is so strong that *it equals the strength of the strand itself.*

These are only two of the many styles of U·S·S American TIGERWELD Bonds. For complete information, get in touch with our nearest sales office. And don't forget to write for our free catalog.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
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UNITED STATES STEEL

8,000,000* FINGERS Remove Tramp Iron

It's the Dings Rectangular Suspended Magnet

*That's the approximate number of lines of force emanating from the surface of a 48" Heavy-Duty Dings Rectangular Suspended Magnet.

The Dings Rectangular Spout Magnet is for installation in chutes to remove iron from dry materials or liquids. As material flows over the magnet, iron is attracted and held securely against the downflow of material.

Dings Rectangular Magnet installed above chute.

THAT's a lot of power for extracting tramp iron from stoker coal, a lot of protection for expensive machinery — enough magnetic strength to allow heavier loads (up to 15 inches deep) at higher belt speeds—enough protection for the *toughest* tramp iron removal jobs—the kind of protection only a Dings Rectangular Magnet can give you.

The operation can be made completely automatic with the Self-Cleaning Rectangular Magnet which incorporates a cross belt to carry the iron off to the side. Complete removal of damaging tramp iron will save you money. Ask for CATALOG 301-A.

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"HIGH INTENSITY"
'Reg. U.S. Pat. Office

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4720 West Electric Avenue
MILWAUKEE 14, WISCONSIN

Pittsburgh Coal Co., on the Monongahela River near Courtney, Pa., plans call for an improved harbor extending 1,455 ft along the west bank of the river. A 42-in conveyor belt will run from the mine's transfer house to the loader. The Dravo organization also will improve harbor facilities and build a coal-loading dock for the Morris Creek mine of the Central Appalachian Coal Co., on the Kanawha River near Montgomery, W. Va. The improvements will permit loading coal barges from the mine tipple via a conveyor system to the river.

The Rich Hill mine of the McClane Mining Co., Washington, Pa., has been taken over by the Fort Pitt Coal & Coke Co., effective Sept. 1. W. H. McClane is president of the Fort Pitt company and Robert L. McCarrell Jr. is secretary-treasurer.

Opening of its new Delmar No. 2 strip mine by the R. & R. Coal Co., Clarksburg, W. Va., recently was reported. Located at Flemington, W. Va., on the B. & O., the property mines the Pittsburgh seam and has a capacity of 1,000 tpd. A crusher and screens for various sizes are included in the tipple equipment.

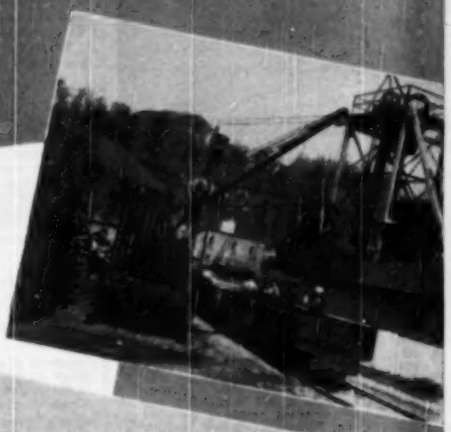
Re-opening of the Francis (W. Va.) mine of the Amigo Smokeless Coal Co. was reported last month. Closed since April 1 because of market conditions, the operation initially will employ 150 men and produce about 500 tpd, approximately half of its previous output.

Shutdown of operations of the Phoenix Park Colliery of the Phoenix Coal Co., Pottsville, Pa., under a court-appointed receivership, recently was reported. John Oshinskie, UMWA official and one of the three receivers, blamed discouraging low production by miners as one of the key factors in the shutdown, but also cited "mismanagement" as well for the fast-mounting difficulties of the operation. Some shifts had produced an average of only about half a car per man at the face, far below the output required to make the operation worthwhile, it was said. "We have made every human attempt to work out the problems and save the colliery," Mr. Oshinskie said. "Day after day, I personally pleaded with the men to cooperate and boost production, warning them of what faced all of us if they failed to do their best. Without reasonable production, we just had to give up," he reported.

Three new truck-mine developments in Eastern Kentucky recently were reported. The Courtesy Coal Corp., recently organized by E. B. Webb, Theodore and Oscar Garrison, Manchester, Ky., reportedly is developing several mines in the Wooton's Creek area of Leslie County. Output will be trucked to Manchester,

MECHANIZE YOUR OUT-OF-MINE JOBS TOO

GET a Bucyrus-Erie Hydrocrane and cut costs on countless digging, lifting and maintenance jobs around the mine. This fast truck rig eliminates slow and often hazardous hand methods . . . reduces cost on dozens of operations around the property. Two sizes — ½ yd. 2-ton; ¾ yd. 3-ton.



SAFE HANDLING

Here an H-3 Hydrocrane, equipped with 3-tine hydraulic grapple, loads ties at an Eastern coal company. Every crane function is fully hydraulic. Control is so precise a load can be moved a fraction of an inch at a time — a big safety factor for men working around the crane.

SMOOTH DIGGING

Hanna Coal Co., Adena, Ohio, uses its Hydrocrane to excavate for concrete foundations prior to erection of a coal preparation plant near Cadiz, Ohio. Operation is extremely simple, hand levers only — no foot controls. Inexperienced men have learned to run it in less than three hours time.

QUICK CLEAN-UP

Clean-up work around tipple tracks used to be expensive and bothersome for this company. Now their Hydrocrane handles the job in short order. Complete crane attachments include hydraulic clamshell, trash bucket, 3-tine and multi-tine grapples, magnet, crane hook and coal car cleaning bucket. This specially designed bucket has cut coal car cleaning costs by as much as 50 percent.

Send the coupon for full details.

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Gentlemen: Tell me more about the Hydrocrane for coal mine use.

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FEEDOWEIGHT

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tells rate per hour —weight per day

A self-contained automatic conveyor scale, combined with automatic gate to give feed rate control. Powered feed regulator operates gate, without restraint on scale beam. Feed rate may be varied. Large feed opening insures even flow. Uniformly feeds bulk material BY WEIGHT; and automatically totalizes weight of materials fed. Durable. Simple to operate. Rugged, heavy duty design. Slow moving parts means long life. Easy to install and maintain.

Manufacturers of

The Merrick WEIGHTOMETER, which weighs any material carried on a belt conveyor without interrupting conveying operation. Complete descriptive matter on request.

MERRICK SCALE MFG. CO.

Engineers and Mfrs. of Automatic Weighing Equipment

PASSAIC, N. J., U. S. A.

What's Happening to Coal and Business Activity

Coal Production		1950 to This Date	1950 Over 1949, to Date
Est. anthracite prod., week ending Sept. 9	768,000	30,424,010	+3.9%
Est. bituminous prod., week ending Sept. 9	10,020,000	330,901,000	—0.3%

Source: U. S. Bureau of Mines.

	Bituminous Coal Stocks (Thousands, net tons)				Consumption (Thousands, net tons)		
	Aug. 1, 1950	Days' Supply	July 1, 1950	Aug. 1, 1949	July, 1950	June, 1950	July, 1949
Electric power utilities	20,581	94	19,505	25,062	6,797	6,779	6,168
By-product coke ovens	10,417	39	11,280	13,896	8,340	8,072	7,808
Beehive coke ovens	.....	..	.....	.....	791	864	68
Steel and rolling mills	891	51	951	1,214	539	538	505
Cement mills	939	47	962	1,469	625	636	629
Other industrials	13,762	63	12,758	16,089	6,735	7,127	3,514
Railroads (Class 1)	3,238	21	3,802	8,669	4,750	4,727	4,974
Retail dealers	2,328	13	2,178	2,720	3,238*	4,485*	4,042*
Total	51,995	46	51,376	69,119	33,815	33,248	29,908

Source: U. S. Bureau of Mines. *Retail dealer deliveries.

Business Activity	Latest Week*	Month Ago	Year Ago
Business Week Index of Business Activity, wk. ending Sept. 9	220.3	220.8	185.4
Steel ingot operations (% of capacity)	99.6	100.1	86.6
Electric power output (million kw-hr)	5,029	5,253	5,258
Crude oil production (daily avg., 1,000 bbl.)	5,909	5,675	4,903
Misc. and L.C.L. carloadings (daily avg., 1,000 cars)	81	80	76
All other carloadings (daily avg., 1,000 cars)	61	60	50
Prices, spot commodity index (Moody's, Dec. 31, 1931 = 100)	477.1	450.0	348.1
Prices, industrial raw materials (B.L.S., Aug. 1939 = 100)	307.0	284.4	229.4
Prices, domestic farm products (B.L.S., Aug., 1939 = 100)	359.8	348.0	305.1
Prices, finished steel composite (*Iron Age*, lb.)	3.837c	3.837c	3.705c
90 stocks, price index (Standard & Poor's Corp.)	149.2	145.7	123.1

*Date of latest week for each series on request.

16 mi away, and initial capacity is expected to be 1,000 tpd, with further increases anticipated. The Adams-Holland Coal Co. has been formed by Howard Adams and R. R. Holland, of Whitesburg, to operate truck mines on the Kentucky River, near Kona. Two mines have been opened, with a total output of 600 tpd loaded over the A. L. Bastin ramp on the L. & N. at Kona. Two other mines are planned, also in the Elkhorn seam, and eventual capacity is to be from 1,200 to 1,500 tpd. N. J. Lucas has leased coal land on Breeding's Creek on the Knott County border and has begun development of several mines, with a total output of 1,000 tons a day. Coal will be hauled 6 mi to Sassafrass, Ky., loading over the L. & N.

Cut Your Bearing Cost

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THE Engineered BRONZE

with Promet axle bearings, journal liners, bushings and wearing parts for General Electric, Sullivan, Goodman, Oldroyd, Jeffrey, Westinghouse and Joy equipment.

A specific formula for every requirement.

A MONEY-BACK GUARANTEE OF LONGER SERVICE AND LOWER MAINTENANCE COST

PROMET BRONZE BAR STOCK

Round, solid or tubular. Rough cast or fully machined. Cored stock, all sizes (by ⅛" steps) from ⅝" minimum core to 28" O.D. and 13' lengths or less. Six grades of hardness.

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Prompt deliveries. Stocks maintained at

BECKLEY, W. VA., The Universal Supply Company, 1207 S. Kanawha St. ..... Phone 7207
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NEW YORK CITY, Trans American Commerce Co., Inc., 165 Broadway ..... Phone 7-4340

Imperial Coal Award Given Employee's Son

The Imperial Coal Corp. last month announced that its $500 yearly scholarship offered employees or sons of employees for study of mining engineering at Penn State College for the year 1950 had been awarded to Donald Eget, of Coalport, Pa. Mr. Eget, who entered the college at the Altoona Center this fall, is the son of Joseph Eget, an employee of the company's Cambria Smokeless mine, under J. B. Helman, superintendent, since 1937. Young Mr. Eget was graduated from high school last June.

The scholarship is the second awarded by Imperial. Albert W. Turchick, of Coalport, received the grant last year, also entering the Altoona Center. This fall he transferred to the college campus at State College to continue his studies.

WHY MINE OPERATORS GET 30% to 60% Longer Service FROM WIRE ROPE OF THIS DESIGN

J&L STEEL

Mine operators get 30% to 60% and even *longer* service from wire ropes of this unique design because *it has more steel and fewer voids than any conventional wire rope!* Result: Higher strength . . . Greater flexibility . . . Easier handling . . . Longer life.

Published records prove that this wire rope, when used in applications for which it was designed, reduces operating costs, diminishes downtime and increases profits.

Known as CENTERFIT, an exclusive J&L wire rope, it is laid together in *one* operation. All strands run in the *same* direction. Outside strands fit snugly into valleys between inside strands, eliminating crossing as in conventional designs. *This prevents internal nicking.*

CENTERFIT is recommended for *hoist lines, closing lines, cable controls* on earth moving equipment, and *draglines* when operating on small diameter drums and sheaves.

In addition *only* J&L wire rope is lubricated with BRONZ-LUBE—the lubricant with the high film strength that prevents squeezing out between strands. BRONZ-LUBE contains fine flakes of soft bearing metal providing a smooth wear-resistant bearing surface for every wire—forms close adherent coating that doesn't drip off unless subjected to high temperature.

HERE'S HOW YOU CAN SAVE MONEY ON WIRE ROPE

Keep an accurate performance record on your present wire rope on applications mentioned above. When it is worn out, switch to J&L CenterFit and compare its performance with what you are now using. We'll gladly send you a wire rope service card with a plastic holder *free!* Write on your business letterhead to: Jones & Laughlin Steel Corporation, 411 Jones & Laughlin Building, Pittsburgh 30, Pennsylvania.

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

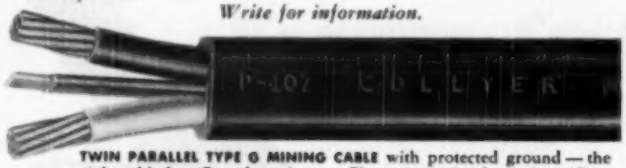
PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

CHOOSE Collyer MINING CABLES FOR POWER

WHERE YOU NEED IT WHEN YOU NEED IT

You can depend on Collyer Mining Cables to deliver full power to your electrical equipment year in and year out. Conductors and insulations are designed for maximum carrying capacity. Top quality materials go into the insulations, providing high dielectric strength and economical, trouble-free power transmission. Outer jackets are built to withstand tough service in the mine: heat, abrasion, moisture, oils, acids, and alkalies. And for extra safety, Collyer Mining Cables meet the rigid safety specifications of the Commonwealth of Pennsylvania.

Write for information.



TWIN PARALLEL TYPE G MINING CABLE with protected ground — the right cable for off-track equipment. Flat construction for easier reeling. Approved by U. S. Bureau of Mines and branded with Official Pennsylvania No. P-107.

ASBESTOS VARNISHED CAMBRIC (A.V.C.) — ideal for permanent installations and "hot" operating conditions. Safe for temperatures to 230°F. and voltages to 7,500.

HEAVY DUTY NEOPRENE SHEATHED PORTABLE CABLE — built to stand hard use, abrasion, and constant flexing. Available in many types and sizes — three-conductor style shown.

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Lewis' Labor Day Talk Cites Bargaining Aims

"The United Mine Workers stand for participation in increased industrial efficiency. The United Mine Workers reject the theory that the cost of living should be used to decide the wages of the workers," John L. Lewis told 8,000 anthracite miners and their families at a Labor Day celebration in Coaldale, Pa. The occasion also marked the 50th anniversary of the establishment of Local 1536.

In his talk, which was one of the most complete explanations of the UMWA's approach to collective bargaining he has made publicly in recent years, Mr. Lewis paid tribute to the men who had helped build the UMWA up to its present position. "And from every standpoint," he emphasized, "the United Mine Workers is equipped to accomplish more for its membership in improved standards of living and greater opportunities and privileges, and to make more of a contribution to our national and community life in the next 50 yr than has been the case in the past 50 yr."

In discussing the UMWA's objectives in wage negotiations, Mr. Lewis had the following to say: "The anthracite industry has perhaps the most reasonable relations between employers and employees, as represented by the United Mine Workers, of any major industry in this country. The long struggles that we have gone through, the tremendous sacrifices that our people and the community have at times endured, are bringing in themselves some degree of recognition in this industry to the point that it seems wise at times to settle by negotiations rather than through prolonged industrial struggle.

"The bituminous coal operators are gradually learning that lesson. The United Mine Workers stand for participation in increased industrial efficiency. The United Mine Workers reject the theory that the cost of living should be used to decide the wages of the workers. The United Mine Workers reject the theory that they only want increases in wages when the price of milk or meat or shoes or shelter goes up. The United Mine Workers want a participation in the increased profits of industry coming from new efficiencies and modern methods so that the investor and the operator will not be the sole beneficiaries of all the improvements of modern techniques. The United Mine Workers insist that they shall have their share of any improvements in the methods of mining. . . .

"Now what is a reasonable share. Under our form of government there are three parties to participate in new improvements, new efficiencies, new inventions, new formulas meaning increased productivity: one, the investor, whose investment is made more secure and more profitable; two,

a sure way to cut maintenance costs!

● That's right. Republic's Champion Air Hose will cut a big chunk out of your maintenance costs . . . relieve you of many a maintenance worry.

It's a fact, proved over and over again under the toughest conditions possible.

You see, Republic's Champion is a top-quality, braided hose, combining ruggedness with extreme flexibility and light weight. It's built with a smooth, friction-reducing, oil-resistant inner tube, surrounded by multiple braids of specially processed, chemically strengthened yarn. Its thick, armorlike safety cover wards off destructive blows from falling objects . . . stands firm against abrasion and wear.

Champion Air Hose, with the yellow safety cover, is available in braided, mandrel-cured construction in 50-foot lengths.

Your local Republic Distributor can help you choose the right hose for your job. Consult the yellow pages in your telephone directory for his name or write direct for information.

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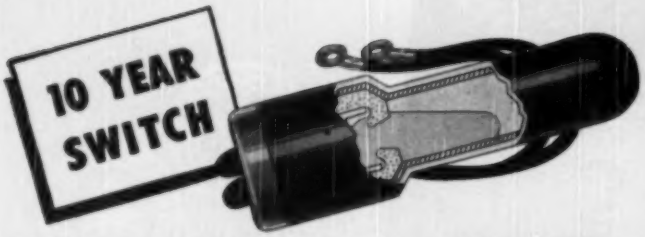

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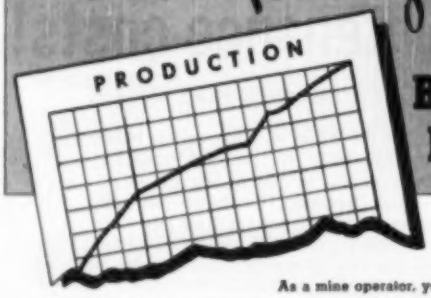

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Through Coal Operators Casualty Company's Specialized Services claims are handled promptly and satisfactorily . . . and through engineering facilities—work stoppages as the result of high accident frequencies can be reduced . . . litigation time and costs lessened . . . and production methods improved. Write today for details!

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THE SYMBOL OF SERVICE FOR COMMERCE AND INDUSTRY

COAL OPERATORS CASUALTY COMPANY
GREENSBURG, PA.

the worker, whose hours are shortened, whose wages are increased, whose conditions are improved and whose life is safeguarded to a greater degree by pensions or what have you; three, the public, who gets a unit product at a lower price. Those are the three.

"How much for each? That's debatable in the market places. That's collective bargaining. That's what we sometimes agree on and that's what we sometimes fight about. But the cavilling and the controversy in the market place is just as old as people are free.

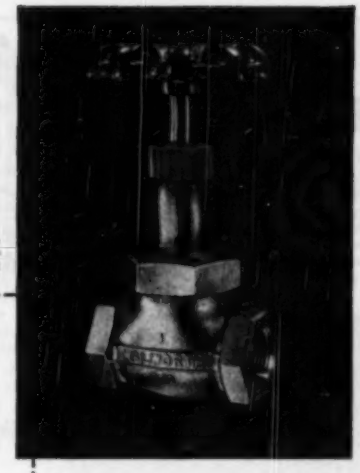
"The only difference between freedom and serfdom is the right of the buyer to buy or refuse to buy and the right of the seller to sell or refuse to sell. And the argument over those two points has been convulsing the market places as long as there is a written record of man in a free country. And that's what we believe collective bargaining in this country should be."

"The Taft-Hartley Law is a pestilence, a scourge, and an abomination in a free country," Mr. Lewis also maintained. "When you take away from an individual the right to sell his goods or services, or to withhold the sale of of his goods or services, you take away his freedom.

"The right to strike is inherent in a free country. And the right to strike cannot be taken away by statute without making the individual a serf and subject to the terms and conditions of his adversaries." He went on to suggest that President Truman abolish the law and keep a little liberty here at home, since the President has said that he was anxious to assist peoples of all liberty loving countries.

He had recently assured the proper persons in government that the UMWA and its members "will be glad to cooperate with our government in supplying an abundance of coal for our national economy and for any enlarged war effort," he stated. "I have taken a fixed position, however, that it is not necessary for our workingmen to be slaves in order to win a war. I think free men can win a war if you give free men a chance to win a war. In return we only ask fair treatment on such problems that may arise."

In speaking of the willingness of William Green, president of the AFL, to give a no-strike pledge, Mr. Lewis said: "I think he forgot the interests of the people who pay his salary in undertaking to deliver 16 million Americans who are members of unions into a non-bargaining position before the corporate employers of this country who would be prompt to take every advantage of it in negotiation. So you may rely on your union protecting your interests in the future as it has in the past insofar as we are able to do it."



take a good look at the Walworth "500 Brinell" no. 225P Globe

IDENTIFICATION DISC: An aluminum marking plate on all Walworth No. 225P's facilitates inventory control and makes reordering quick and positive.

NEWLY DESIGNED HANDWHEEL: Patented air-cooled, finger-fit handwheel affords sure grip even with greasy gloves.

IMPROVED PACKING: Molded packing of lubricated asbestos reinforced with copper wire. Suitable for practically every service. Valves can be repacked under pressure when fully opened.

– the Toughest Bronze Valve Your Money Can Buy

The stainless steel, corrosion resistant seats and discs are heat treated to a hardness of 500 Brinell – hard enough to scratch glass and crush nails! The valve can be closed on sand, slag, and pipe scale without injury to the seating surfaces. "Wire drawing" is practically eliminated. All parts are accurately machined and gaged. Years of tight, positive shut-off are assured.

Available in both globe and angle types (angle type: No. 227P) in sizes ¼" to 2", this quality valve is recommended for 350 lbs. W.S.P. at 550 F, and 1000 lbs. non-shock service on cold water, oil, gas, or air.

For full data on this long-life, economical Walworth Bronze Valve, see your local Walworth distributor, or write for Circular.

note these 7 Great Features

HEXAGONAL UNION BONNET CONNECTION, DEEP STUFFING BOX AND RUGGED STUFFING NUT: Union bonnet connection eliminates any chance of distortion or leakage even though valve is repeatedly taken apart and reassembled.

OVERSIZE STEM: The high-tensile strength silicon-bronze stem assures long life and protection against wear.

SEATS AND DISCS: Plug type seats and discs of stainless steel, heat-treated to 500 Brinell hardness and machined simultaneously to a mirror-like finish, with accurate tapers assures tight positive shut-off with minimum handwheel effort.

EXTRA STRONG BODY: Made of Composition M (ASTM B61) bronze. Thick walls and rugged bosses provide a high safety factor. Valves undergo hydrostatic shell test of 1,000 psi.

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A TRULY PORTABLE BOND WELDER!

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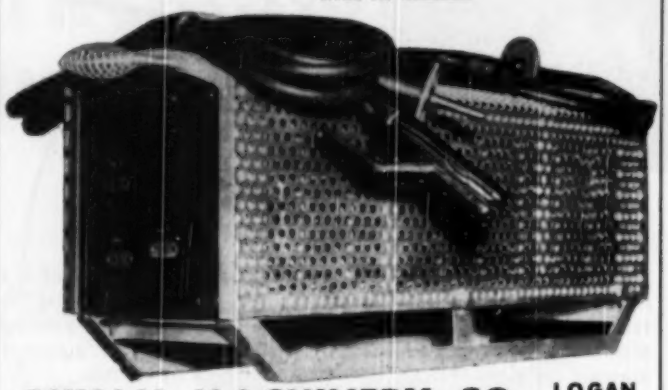

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Core drill can be mounted on truck or jeep

The new Acker Teredo is light, so compact, so simple that it can be mounted easily on truck or jeep and driven by separate motor or power take-off. Compact as it is, the Teredo is a high capacity, fast-operating unit capable of extracting cores up to 2 3/16" in diameter and of drilling to depths of 600 feet.

Special Acker bituminous core barrel recovers cores where others fail. Ask about it.

Send for bulletin #3-C-CA

ACKER DRILL COMPANY INC.

Scranton 3, Penn.

65 New Products . . .
OR CATALOGS are described in this month's New Equipment section starting on p 110. Have you checked through them—or are you missing a good bet that may help you jack output and cut operating costs?

Keep Sen. Taft Out of Ohio Mines, Lewis Says

Miners might stop working if they are visited by Sen. Robert A. Taft, John L. Lewis told Ohio operators in a letter written Sept. 19 to R. L. Ireland, president, Ohio Coal Association.

Busily campaigning for re-election, Sen. Taft reportedly expressed amusement at Mr. Lewis' letter. "In the first place," he said, "we haven't any mine visits on our schedule. We have some miners' rallies scheduled but I don't think Mr. Lewis can do anything about that." If any mine visits were planned, "I would go right ahead and keep them," Sen. Taft stated.

In his letter to Mr. Ireland, Mr. Lewis said:

"Taft's secret political handlers propose to have him enter coal mines to cozen the men underground. This will be bad from the standpoint of coal production.

"Taft was born encased in velvet pants, and has lived to rivet an iron collar around the necks of millions of Americans. He is the relentless, albeit witless, tool of the oppressors of labor.

"You should refuse him entry to mines where Americans toil. The underground workings are necessarily confined, and the air therein is easily contaminated. The effluvia of the oppressor is ever disagreeable and could enrage the men to a point of evacuation of the mine. This we would both deplore."

Two Utilities Plan New Steam Electric Plants

The Appalachian Electric Power Co. recently announced that construction would be started immediately on a new steam-generated electric power plant at Glasgow, W. Va., on the Kanawha River, 20 mi above Charleston. The initial installation of 350,000 kw is expected to be in operation by 1953. The plant will ultimately have a capacity of 1,050,000 kw and will cost an estimated $40,000,000.

The Ohio Edison Co. also announced plans for a $20,600,000 steam-electric plant, to be located on the Mahoning River at Niles, Ohio. It will have a capacity of 106,000 kw and will be the largest in the company's system of 14 plants. The company's present capacity is reported at 1,141,000 kw. Construction is scheduled to start about Jan. 1.

Thor

ROOF BOLTING TOOLS FOR COAL MINING

Roof Bolting in coal mines is now definitely established as a safe and economical operation as a result of government and private research and experiment. Complete information is available from the United States Bureau of Mines, which recommends for the operation the types of tools shown below. A request for a Thor Service Engineer will place this information, along with complete specifications on the tools, at your disposal. Write, wire, or call today. *Independent Pneumatic Tool Co., Aurora, Ill.*

STOPERS

Standard Thor Stopers with Automatic Rotation are available in three sizes, from the popular 83 lb. machine (56" overall) to the heavy duty 116 lb. Stoper (58¾" overall), with standard or reverse feed.

45 LB. SINKER WITH SHORT LEG

New Thor development permits use of 45 lb. Sinker and rigid side-clamping device with special short-length air-feed to meet every coal mining requirement, even in shallowest veins. Write for details!

BOLT DRIVER

A non-rotating percussion tool, the 29 lb. Thor No. 18 Pin and Bolt Driver delivers abundant power for Roof Bolting.

IMPACT WRENCH

Thor Heavy Duty No. 20 Reversible Impact Wrench outperforms, out-wears anything in its class. *Positive* power transmission, large radius blow delivered closer to the work does the trick. Competitive demonstrations invited!

Thor PORTABLE POWER TOOLS

FOR MODERN MINES

Preparation Plant Builder states . . .

"We are using perforated stainless steel screens for dewatering and desanding on all new equipment being built by us. Stainless steel screens give more satisfaction over a longer period of time because of retaining hole sizes. The user benefits by greater operating satisfaction and by reduced labor maintenance costs."*

They maintain uniformity of mesh and they minimize labor maintenance expense! Plant operators themselves, emphasize that because of its much greater resistance to abrasion and corrosion, stainless steel gives far longer service life than any other material.

Hendrick perforated stainless steel, furnished in an unsurpassed range of shapes and sizes of perforations, meets any specific requirements. Write for full information.

*From U. S. S. Stainless Steel Screens.

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41 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

Perforated Metals
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Mitco Open Steel Flooring
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...YOU CAN USE

Commercial Liner Plates

TO CUT ENTRY COSTS!

. . . eliminate costly labor installing wood reinforcing.

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The

COMMERCIAL SHEARING & STAMPING CO. YOUNGSTOWN 1, OHIO

Inventory Controls Set For 32 War Materials

In its first regulation designed to speed the defense effort, the newly created National Production Authority placed inventory controls over 32 important war materials, effective Sept. 18. The order requires everyone but "ultimate consumers buying for personal or household use" to limit their stocks of controlled materials to a "practical minimum working inventory."

Such an inventory is defined as "the smallest quantity of material from which a person can reasonably meet his deliveries or supply his services on the basis of his currently scheduled method and rate of operation. Producers are not required to dispose of excessive inventories now on hand, but they may be requisitioned by the NPA. Violators, subject to fines up to $10,000 and 1 yr in prison, are those who buy more than a normal supply of any of the materials covered, or anyone who knowingly sells them to a hoarder.

The controlled materials include building materials, chemicals, forest products, iron and steel, certain metals and minerals, rubber and some textiles. Metals and minerals include aluminum, columbium, cobalt, copper, magnesium, manganese, nickel, tin, tungsten, zinc and non-ferrous scrap. Building materials include portland cement. Mine ties are specifically excluded from control.

State Safety Champs Crowned in Three Meets

The Colver mine team of the Ebensburg Coal Co. took first place in the 8th annual first-aid meet sponsored by the Pennsylvania State Bituminous Safety Association. Team members received various prizes, including a $350 cash award. In second and third places were the team from the Springdale mine, Allegheny Pittsburgh Coal Co., and Harwick No. 2 mine, of the Duquesne Light Co. A total of 33 teams participated.

In a revival of the annual West Virginia first-aid meet, held in Dunbar Sept. 9, the team of the Carbon Fuel Co. emerged with top honors. Teams of the Puritan Coal Co. and the South Union Co. placed second and third, respectively.

Some 5,000 people reportedly attended the All-Ohio Safety Meet and other festivities composing a full-day's program. Winner of the meet was the Willow Grove mine Team No. 1 of the Hanna Coal Co. Powhatan No. 1 team of the Powhatan Mining Co. was the runner-up, and Mine No. 3 team of the Rail & River Coal Co. placed third. The program included a baseball game, presentation of safety awards to individuals and companies and crowning of a King and Queen of Safety and their consorts.

Designed for Greater Range and Capacity

LIMA 2400

This big machine is engineered and constructed for extra-heavy duty. It has met with enthusiastic acceptance, and is setting new performance records on coal stripping and mining operations.

Features include: "precision" air control of all operating functions; anti-friction bearings at all vital bearing points including drums, cone rollers and hook rollers; Large, grooved drums—tapered for shovel operations; truck base and rotating base of heavy one-piece annealed cast steel; extra sturdy construction; easy accessibility of all parts requiring lubrication or maintenance; Hamilton Diesel power plant—plus many other features for maximum performance and availability.

The LIMA line includes Shovels ¾ to 6 yards, Cranes to 110 tons, and Draglines, variable. Offices in principal cities of the world.

LIMA Rubber Mounted Cranes are Available in 20 and 35 Tons Capacity

6-YARD SHOVEL
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5-7-YARD DRAGLINE
•
110-TON CRANE

Lima Shovel and Crane Division

LIMA, OHIO

OTHER DIVISIONS: *Lima Locomotive Works Division; Niles Tool Works Co.; Hooven, Owens, Rentschler Co.*

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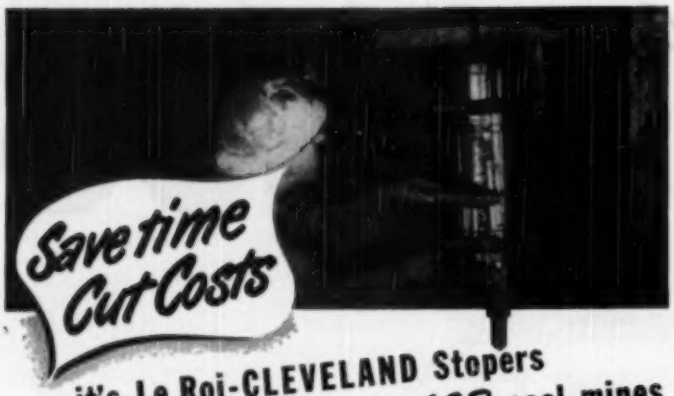

. . . it's Le Roi-CLEVELAND Stopers in *91* out of *103* coal mines

Yes, according to an official report 91 out of 103 mines in one of the country's leading coal-mining areas use Le Roi-CLEVELAND Stopers. Here's why these favorites are your best choice:

- The only complete range of sizes to meet every mining condition including special short-leg stopers for low coal.
- Fast drilling and easy to handle.
- Trip rotation that permits drilling and driving roof bolts with same stoper.
- Designed and built to stay underground where they're needed to keep your costs down.

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REALLY CLEANS SHOWER STALLS

Removes rust stains, lime deposits, soap, oil, body grease and algae formation.

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***MINIMIZES CONDITIONS THAT BREED AND SPREAD INFECTIOUS GERMS**

Simply sprinkle Saf-T-Klenz powder on damp surface, mop lightly, and flush with clear water. Harmless to hands, clothing, floor, drains. Odorless.

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Obituaries

K. W. McCartney, 51, president McCartney Coal Co., Morgantown, W. Va., died suddenly Aug. 27, following a heart attack. Mr. McCartney had various business interests, including the Arkwright Supply Co., the Morgantown Block Co., and R. H. McLain Coals, all of Morgantown.

Hubert D. Johnson, 76, former mining engineering consultant and a lifelong resident of Scranton, Pa., died Sept. 2 at his daughter's home in Kingston. At one time he was associated with the late E. B. Jermyn. He also was an engineer for the Scranton Coal Co. and was a mine inspector for Lackawanna County.

Watkins H. Williams, 71, since 1916 real estate and mine-cave agent for the Glen Alden Coal Co., died Sept. 3 at Moses Taylor Hospital, Scranton, Pa.

William G. Geissinger, 63, an electrical engineer associated for many years with the New River & Pocahontas Consolidated Coal Co. and the Berwind-White Coal Mining Co., died Sept. 8 in a Welch, W. Va., hospital following a heart attack suffered 2 wk previously.

James E. Beckett, 40, general mine foreman for the Imperial Colliery Co., Burnwell, W. Va., died Sept. 12 in a Charleston, W. Va., hospital.

Association Activities

Central Pennsylvania Coal Producers' Association and Eastern Bituminous Coal Association held their annual meetings Sept. 14-15 at the Bedford Springs Hotel, Bedford Springs, Pa. Heath S. Clark, former president, Rochester & Pittsburgh Coal Co., was elected president of both associations, succeeding William Wetter, who has served as president since the death of Charles O'Neill. Walter A. Jones, who has served the organizations for 32 yr, resigned as secretary-treasurer. He will continue in an advisory capacity and also will act as treasurer. Robert T. Laing, who joined the two organizations June 1 as executive director, was named secretary. John D. Battle, executive vice president, NCA, was the visiting speaker, discussing national and legislative matters of interest to the industry.

Illinois Coal Operators' Association has elected as president H. A. Treadwell, vice president of operations and engineering, Chicago, Wilmington & Franklin Coal Co. Mr. Treadwell succeeds T. G. Gerow, executive vice president, Truax-Traer Coal Co., who recently resigned because of pressure of other duties.

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- Special Cranes
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- Ore Bridges
- Charging Machines
- Industrial Furnaces
- Gas Flue Systems
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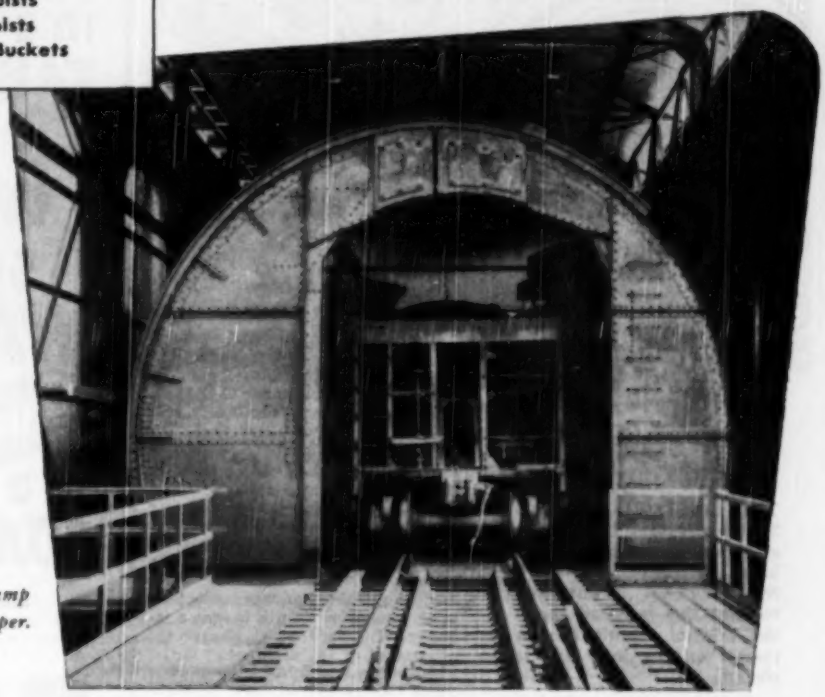
- Coke Pushers
- Mine Hoists
- Skip Hoists
- Clamshell Buckets

WELLMAN Car Dumpers

Select the right dumper from the most complete line



Wellman 60' 4-clamp Revolving Car Dumper.

• The complete line of Wellman Car Dumpers includes Lifting, Turnover, Traveling and Revolving Types. The Revolving Type is an example of Wellman's engineering skill. It is self-contained, requiring no external structures. A rack segment and pinion at each end of the frame turns each end equally, preventing distortion of the frame.

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ENSIGN
Centrifugal Switch

Watchdog of your Conveyor System

Interlocking of Belts

The Ensign Centrifugal Switch provides for the sequence operation of multiple belts. As the belt on which the switch is installed reaches the required speed the control circuit of the starter on the inby belt is closed.

Belt Protection

When used with time delay relay the Ensign Centrifugal Switch prevents burning of belt due to slippage.

Available for A.C. or D.C. current. Write for Bulletin No. 1100.

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ELECTRIC AND MANUFACTURING CO

mac Coal Association, at a meeting of the board of directors Aug. 22, terminated the affairs of the association, and closed its office in Cumberland, Md., effective Aug. 25. Decreasing membership as a result of mine closings in the area did not justify continuance of the association, it was announced. Remaining funds on hand will be distributed to members as their interests appear.

Foreign Developments

GREAT BRITAIN — The National Coal Board has announced a £10,000,000 profit for the first quarter of the year, which is the best quarterly profit since the Board took over the mines Jan. 1, 1947. The profit for the previous quarter was £3,892,045 and for the first quarter of last year £7,532,650. From the £10,000,000 is deducted £3,750,000 estimated interest and £1,000,000 provision for profits tax, leaving a surplus for the quarter of £5,600,011. The surplus for the previous quarter was £792,045 and for the first quarter of last year, £3,832,650.

AUSTRALIA — While showing progress, Australian coal production still is lagging behind its needs by some 2,000,000 tons yearly, a current survey of the situation indicates.

The present conservative government was voted into office last year on the promise to put an end to the chronic coal shortage which was hobbling production efforts in every industry. The election took place in the aftermath of a disastrous strike, which reduced coal production in New South Wales (Australia's principal source of bituminous coal) to 10,736,000 tons in 1949, a million tons less than in 1948.

There has been a real improvement since the turn of the year. Production to July 22 totaled 6,731,000 tons, 1,300,000 tons more than in same period of 1949. Since the war, however, demand has outstripped supply by an ever widening margin, and a serious situation may develop if a major defense production effort becomes necessary. With drastic rationing and every possible economy, there is a shortage of 2,000,000 tons a year, which must be met, at least partly, by long-distance imports.

The clue to the Australian coal problem is in the low rate of man-shift production—called "darg" in Australian mining parlance—which has been set as a standard by union

You would'nt SHIP COAL

in a TANK CAR!

why SHIP WATER

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a C·M·I Centrifugal DRYER

—will turn your slurry and "wet coal" liabilities into assets and . . . profits.

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146 President St., St. Louis 8, Mo.

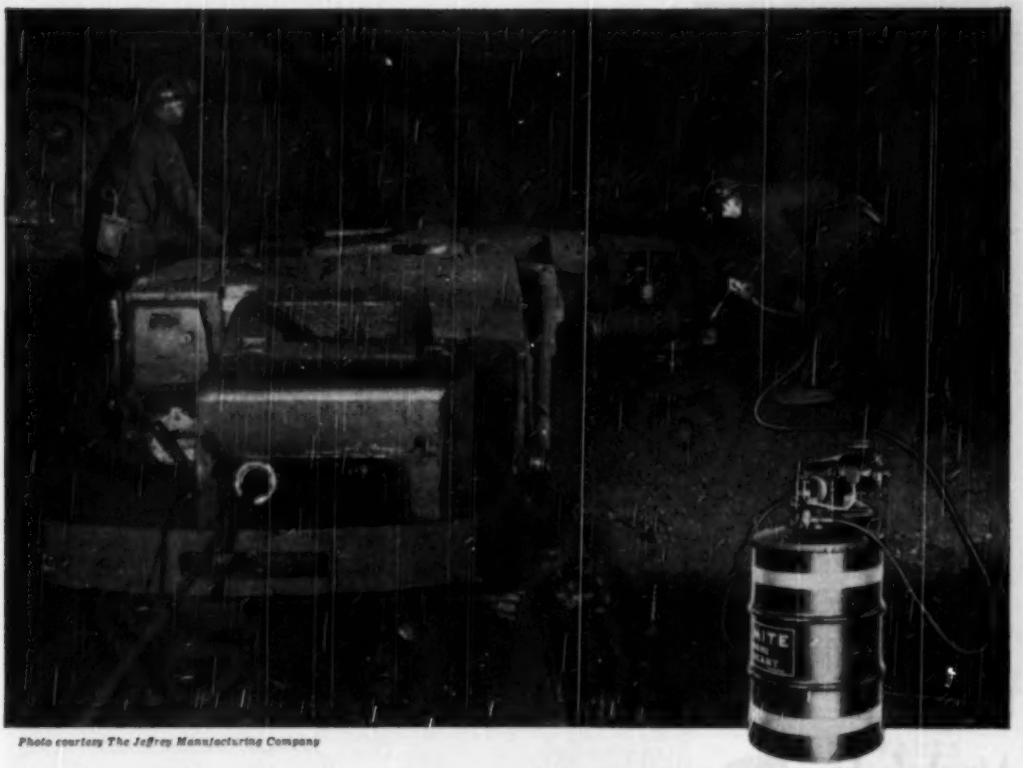


Photo courtesy The Jeffrey Manufacturing Company

how Alemite helps you CUT MINING COSTS

WITH MECHANIZED LUBRICATION METHODS!

In shaft or strip mining, coal dust and dirt are the worst problems you face in maintaining expensive equipment.

That's why Alemite lubrication methods are so important – to cut repair costs, keep lubricants free from contamination, and to save costly man-hours by faster, easier lubrication.

From barrel-to-bearing, Alemite equipment assures safe, fast, clean handling and application of grease and oil. With an Alemite pump in each drum, you can transfer lubricants rapidly, without waste or mess. Refinery-sealed lubricants are kept *clean!* Alemite loader pumps refill grease guns in seconds, saving time, saving grease! Vital machine bearings get clean, *positive* lubrication when you apply grease and oil with mechanized Alemite methods.

Above or below ground, Alemite pumps can be powered with air or electricity, to suit your individual needs. Modern Alemite methods assure positive lubrication for your mine cars and machinery. You get more trouble-free operation at minimum cost per hour!

WRITE NOW for complete details on how to cut your operating costs with Alemite lubrication methods and equipment – mechanized from barrel to bearing. Alemite, Dept. E-100, 1850 Diversey Parkway, Chicago, Illinois.

ALEMITE

Lubrication Methods that Cut Production Costs

Alemite Cuts Costs 3 Ways...

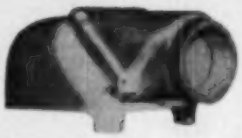
1. In Transferring Lubricants . . . by eliminating mess, expensive contamination – and cutting man-hours 63% for every 100 pounds of lubricant transferred.

2. In Loading Grease Guns . . . by saving 3¾ man-hours for every 100 pounds of lubricant loaded into hand guns.

3. In Applying Lubricants . . . by saving up to 23.9 man-hours for every 100 pounds of lubricant applied to bearings.

FOOTVALVE STRAINERS?

BUY'EM FROM GUYAN



An improved accessory for pumping equipment—provides straining surface approximately double the area of pipe for which the unit is tapped. Has built-in check valve.

GUYAN MACHINERY CO.
LOGAN W. VA.

COAL MEN ON THE JOB

AYRSHIRE MINE, Ayrshire Collieries Corp., Oakland City, Ind.: Orville Bunch (left), shop fore.; and William Nordhorn, storekeeper.

leaders. Many of these leaders have suspect political motives in keeping production down, while the rank-and-file unionist has accepted the principle of output restriction as a necessary safeguard against losing his job. While 15,815 mine workers produced 9,987,000 tons of coal in 1938-39 with relatively little mechanized equipment, the industry will be lucky to produce 13,000,000 tons this year with 18,332 miners, many of whom work with latest types of machinery.

Even though the Communist grip on the coal workers' unions has slipped since the unsuccessful mid-year strike in 1949, the official union organ continues to uphold the party line against installation of more mechanized equipment as a means of stepping up production. The Joy-Sullivan Continuous Miner, several of which have been imported by the Joint Coal Board, has been singled out for particular attention.

"Yes! As one part of 'our' contribution to Yankee Imperialism's developing world war we are to provide more and more coal at less and less cost to the coal owners, which means at more and more cost to us," opens a front-page article in a recent issue of *Common Cause*, official organ of the Miner's Federation of Australia.

"Continuous Miner 'Joy' is a case in point! It is proposed that the actual manning of the machine will be done by two men . . . two men for 400 tons a day! Then, there are loaders for pillars, bigger and bigger draglines for the open cuts, 'streamlining' of work in the pits," the article continues. It winds up with an appeal for increased wages, longer holidays, higher pensions and compensations—and for world peace.

NEW ZEALAND—Open-cast mining is to be started within 15 mo at

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Ask for them by name . . .

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Flexible Ventilation Tubing

The tough, mildewproof, easy-to-install, light-weight mine ventilation tubing with simple patented couplings. Available in several grades, 8" to 36" diameter. Also Non-Collapsible Mine Vent Tubing for quickly exhausting foul air. Made by makers of ABC Brattice Cloth and Mine Vent Powder Bags.

Qualified Distributors Everywhere

AMERICAN BRATTICE CLOTH CORP.
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FOR SAFETY'S SAKE, SUPERIOR COUPLINGS

Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL COUPLINGS

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You asked for it... HERE IT IS—

AO's New Metal Ful-Vue Safety GOGGLE!

HANDSOMER IN APPEARANCE • STRONGER IN STRUCTURE

With the introduction of the F4100 Metal Ful-Vue, AO's protection against the impact of flying particles reaches its highest development. Here in one goggle, with or without side shields, workers can obtain the peace of mind which comes from assured safety . . . the utmost in comfort over nose and temples . . . the very finest in EYE APPEAL PLUS EYE PROTECTION!

QUICK FACTS

NEW EYEWIRE — A major contribution to *looks with strength.* Outer edges are square instead of round with a deep groove to hold lenses securely in place. Beaded engraving adds a distinctive touch. The lightweight eyewire is strong and durable.

NEW RUGGED ENDPIECE—Streamlined . . . with a wide bearing surface at hinge which minimizes temple drop. Screw heads are countersunk and flush with endpieces for added good looks, non-sagging security.

NEW LIGHTWEIGHT TEMPLE—Oval temples instead of round for greater comfort and attractiveness. Easily adjusted, perspiration proof. Insulated semi or half tubing is another appearance improver and will outlast life of the temple. Tubing will not come off and it can't be discolored by dirt or grease. Both the temple and endpiece screws are AO patented "Ever-tite" construction . . . they keep tight in service yet remove quickly when replacing lenses.

IMPROVED GUARD ARMS AND BRIDGE — Guard Arms are newly shaped — longer with more opening for added ease of adjustment. The bridge is double braced with four contact joints — a feature found only in AO Ful-Vue spectacle goggles.

NEW SIDE SHIELD CONSTRUCTION — A real time saver . . . new one-piece binder and eyewire construction *eliminates necessity of inserting the screen before inserting lenses!* Replacement of lenses can now be made without any interference with or from the side shield.

For these and many other reasons, be sure to see the new F4100. YOUR NEAREST AO SAFETY REPRESENTATIVE CAN SUPPLY YOU.

American Optical
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

Two MESCO 1950 Headliners

for greater Safety and Efficiency

MESCO Hydraulic Brake Adjuster

Adaptable to most locomotives. Motorman can adjust brakes quickly—anywhere at any time—with grease gun using any standard grease. No threads to rust, strip, or wear . . . no chance of sudden release of braking power. Available in any length from 10" rod centers up. Can be furnished with tubular grease extension for closed type frames.

MESCO Shock Absorber

"Dead ends" cables and allows for slack when connecting cables to junction boxes or other sources of power. Spring takes up sudden jerks which might snap cable. Equipped with four bolt clamp (illustrated) for use on shuttle cars, or with hinge type clamp for use on other mine machinery. Can be securely bolted to roof or chained to timbers or rail. Recommended for use on electrical, hydraulic, or clutch driven reels.

For information, see your nearest distributor or write direct.

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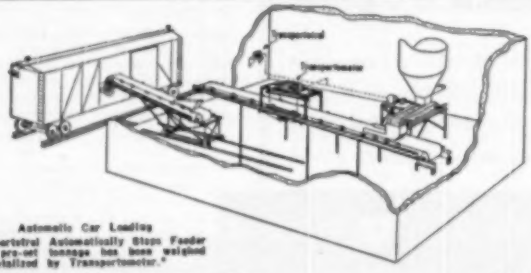

Automatic Car Loading
Transportotrol Automatically Stops Feeder when pre-set tonnage has been weighed and totalized by Transportometer.*

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Transportometer Division
*Reg. U. S. Pat. Office
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New York 5, N. Y.

Huntley, New Zealand, where a deposit, estimated to contain 4,000,000 tons of coal, has been discovered. The seam covers about 150 acres and is 30 ft thick. The operation will eventually produce 600 tpd.

COLUMBIA—Formation of Corporación Carbonera Colombiania to carry out a program of development of coal deposits in Colombia, especially in the Valle del Cauca region, was reported late in August. The present General Administrator of Ferrocarriles Nacionales, Dr. Guillermo Camacho Gamba is general manager of the new corporation. The company is formed with contributions from Instituto de Gomento Industrial, Ferrocarriles Nacionales, and the coal mining companies of the Valle del Cauca.

The new corporation plans an ambitious program, including construction of a washing plant at Cali, supply of coal for all internal needs and export of coal through the port of Buenaventura, when adequate shipping facilities are constructed.

POLAND—The country's new 6-yr plan calls for an increase in coal mechanically loaded from the 5,000,000 tons to be so loaded in 1950 to some 65,000,000 tons in 1955, the *Polish Newsletter* reports. To reach the annual quota of 100,000,000 tons by 1955, as the plan provides, some 60,000 additional miners would be needed at the present rate of production. Instead, mechanization is to be stepped up, with special emphasis on underground loading and Polish construction of loading machinery.

Following a serious accident at a mine in Upper Silesia last May, the director, manager and six supervisors were tried in court on charges of failing to observe safety regulations, the publication also reports. Found guilty of gross neglect, the two top executives were sentenced to 10-yr prison terms. Four of the supervisors were sentenced for terms of 3 to 8 yr, and the other two were exonerated.

Coal Publications

Mineral Industries Education, by Edward Steidle, sponsored by 135 alumni of the School of Mineral Industries, Pennsylvania State College. 252 pp. 6¼x9¼-in; clothbound. $3, Mineral Industries Extension Services, State College, Pa. A discussion of the higher responsibilities of education in general, and mineral industries education in particular, in promoting human progress by formulating a philosophy of conservation and establishing the necessary link between social and technical advances. Illustrated.

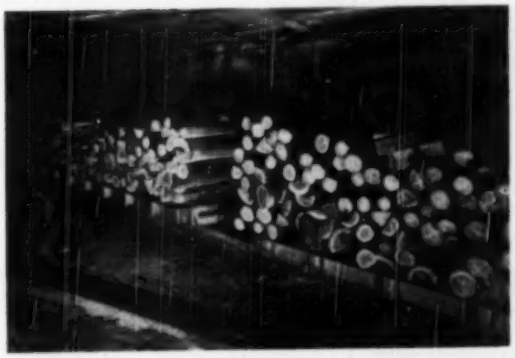
Mineral Yearbook, 1948. U. S. Bureau of Mines. 1,626 pp. 6x9-in; cloth. $4.25, Supt. of Documents, Govern-

Mine timbers and track materials easily loaded in supply yard and easily unloaded in mine

DIFFERENTIAL SUPPLY CARS

These cars yield a handsome return by their economical handling of rails, ties, and other track materials; mine timbers, roof bolts, concrete blocks, bricks and other masonry materials. The low height deck makes it easy to load and unload. The deck is non-skid floor plate to resist shifting of lading. Car is equipped with 8-wheel Axless truck for negotiating sharp curves and rough track. Rugged construction throughout.

Use of Differential supply cars obviously allows for improved safety practices in handling supplies.



GENERAL SPECIFICATIONS

Dimensions:	See drawing reverse side.
Track Gauge:	To suit.
Trucks:	8-wheel Axless type.
Wheels:	Forged steel with renewable rims.
Bearings:	Tapered roller bearings in hubs of wheels.
Springs:	Long and gentle spring action gives easy riding and utmost roadability.
Brakes:	Shoe-type operating on 4 wheels.
Car Frame:	All steel rugged construction—main longitudinal sills and cross sills thoroughly framed together.
Deck:	One-piece non-skid floor plate.
Stake Pockets:	18" apart on each side. Will accommodate scrap pipe or rail as stakes.
Capacity:	15 tons.

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ment Printing Office, Washington 25, D. C. Data on production, distribution and consumption of all mineral commodities, including fuels, with statistics on employment and injuries, for 1948.

Structure of Herrin (No. 6) Coal Bed in Marion and Fayette Counties and Adjacent Parts of Bond, Clinton, Montgomery, Clay, Effingham, Washington, Jefferson and Wayne Counties, by Raymond Siever. Illinois Geological Survey, Urbana, Ill., Circular No. 164. 8½x11-in; paper. 100 pp. plus maps. Price not quoted Seventh in a series of reports describing structure and extent on the No. 6 seam in southern Illinois. Gross minable reserves in the area are 8,584,000,000 tons. Net minable reserves, over 3 ft thick and less than 1,000 ft deep, less coal in closely drilled oil fields, total 6,907,000,000 tons.

Geology of Anthracite in the West-Central Part of the Mt. Carmel Quadrangle, Pennsylvania, by H. E. Rothrock, H. C. Wagner and B. R. Haley. U. S. Geological Survey, Coal Investigation Series, Map C 3. 39x42-in; 3 sheets. $1.50. Director, Geological Survey, Washington 25, D. C. Coal outcrops, mine locations, prospect entries, warranty tracts, barrier-pillar reservations, and mine-refuse areas; structural geology; and cross-sections, correlation charts, columnar sections and two index maps.

Preparation Facilities

Leon Kocher Coal Co., Valley View, Pa.—Contract closed with Menzies Separator Co. for two 2-ft Menzies cones, one to clean rice and barley and one for Nos. 4 and 5 buckwheat; feed capacity each, 7 tph.

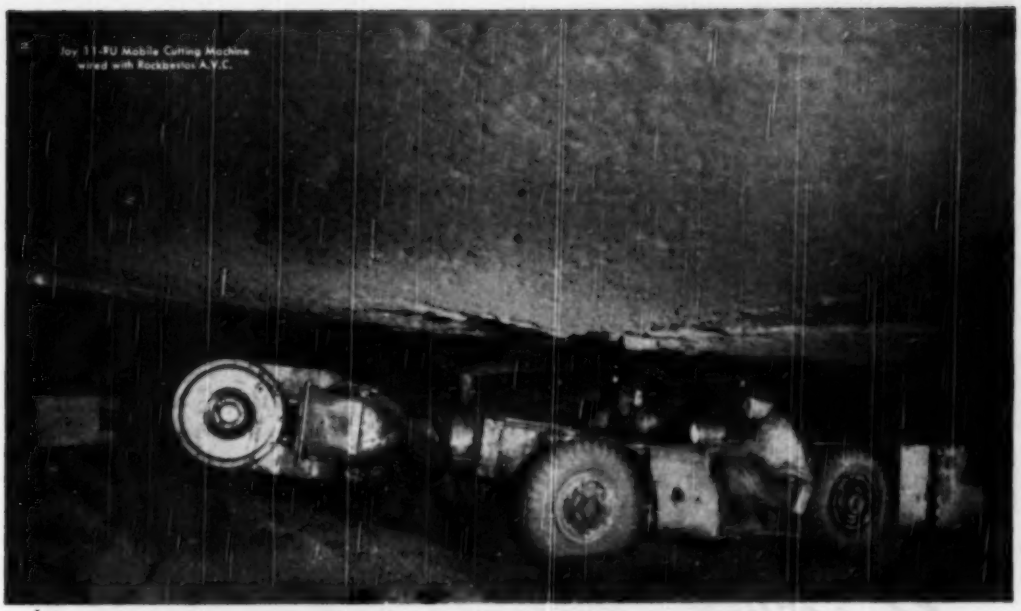
Pompey Coal Co., Jessup, Pa.—Contract closed with Wilmot Engineering Co. for one 3½-ft Hydrotator for No. 4 coal; feed capacity, 20 tph.

Schrader Coal Co., Minersville, Pa.—Contract closed with Wilmot Engineering Co. for one 5-ft Hydrotator for No. 4 coal; feed capacity, 40 tph.

Colitz Coal Co., Pottsville, Pa.—Contract closed with Wilmot Engineering Co. for one 5-ft. Hydrotator for rice; feed capacity, 50 tph.

Di Renzo Coal Co., Llewellyn, Pa.—Contract closed with Wilmot Engineering Co. for one Type A jig for nut coal; feed capacity, 15 tph.

Gulf Smokeless Coal Co., Tams No. 2 mine, Tams, W. Va.—Contract closed with Fairmont Machinery Co. for coal-preparation addition to present tipple, including a Chance heavy-density cone to clean 7x⅛-in at the rate of 210 tph; r-o-m capacity of plant, 400 tph.



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When it comes to designing cost-cutting mining equipment . . . equipment capable of years of trouble-free service...the pace-setting manufacturers of mechanized mining equipment consistently pick Rockbestos A.V.C.* Little wonder, for this sturdy cable was expressly built to take the toughest mining abuse. Insulated with varnished cambric and impregnated felted asbestos, it can't burn . . . resists moisture . . . stands up under heat.

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THESE *Superior*
DESIGN FEATURES:

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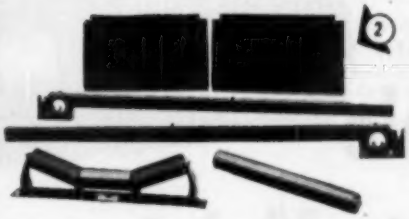
DRIVE SECTION—Designed for easy dismantling. Available for A.C. or D.C. operation up to 75 H.P. Larger drive units upon request.

Typical CONTINENTAL underground Belt Conveyor installation.



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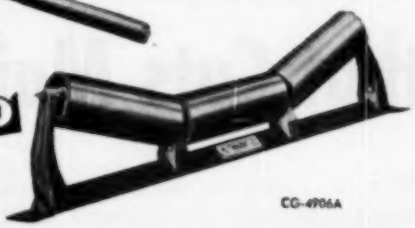
INTERMEDIATE SECTION — Designed for easy erection and dismantling, thus requiring a minimum of personnel during moves or extensions. Available in lengths up to 3000 feet.



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IDLER ROLL — Four-inch diameter anti-friction idler rolls. Designed for complete lubrication from either side.

CG-4906A

Complete units available in 24", 30", 36" and 42" belt widths.

For Other Types of Belt Conveyor Equipment, See Our Catalog ID-481

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Built to out-gun and out-maneuver any armor of its size in the world, the Patton weighs in at 47 tons . . . most of it steel.

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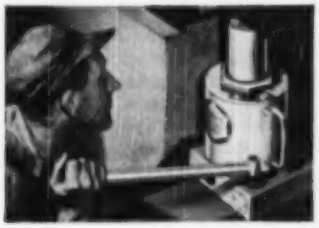
You'll say it's a "Beaut" and a BRUTE!



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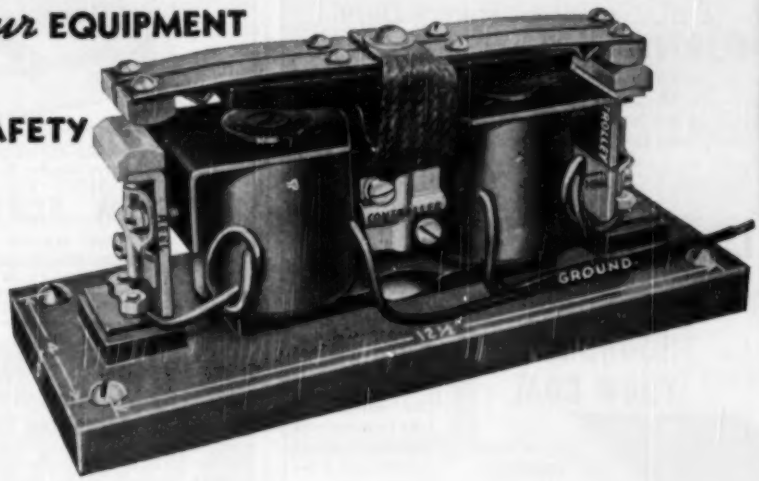
SINGLE OR DOUBLE TROLLEY AND REEL . . .

ELIMINATES SHOCKS *and* BURNS

PROTECTS *your* EQUIPMENT

PROMOTES SAFETY



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Automatically transfers the current from trolley to reel, or vice-versa. Hand operated switches are eliminated.

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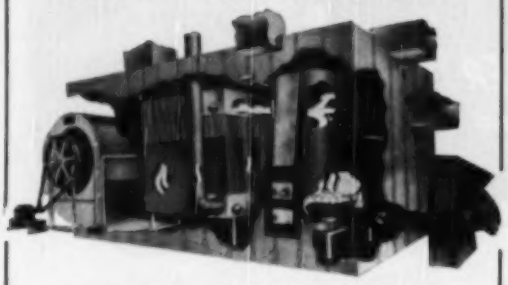
USES NO WATER!



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FURNACE FAN SYSTEM

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Avoid loss of production time with this PROVEN heating system—designed especially for coal mine buildings. Lower costs, better performance, wide coal field use.

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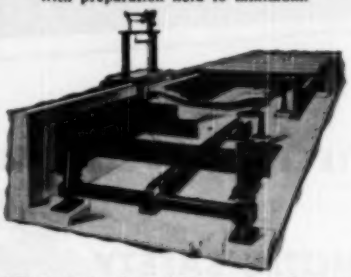
TYPE "C. S." *Portable Scale*—easily and quickly set up—with preparation held to minimum.



TYPE "S" *Pit Scale*—for weighing trucks and tractor trailers—Platform lengths 18 ft. to 60 ft. inclusive.

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Scale Manufacturers since 1896

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An analysis of the Technical and Economic Factors which control the Commercial Feasibility in the United States of Manufacturing Fuel Gas from Oil.

HERE is a book that discusses all the technical methods and economic factors concerned in producing fuel gas from coal, also giving cost data on various other fuels. It presents valuable information on operating costs, maintenance, investment cost of gasification equipment and processes, and current research developments. It brings together data on supplies, demand, and prices of oil, gas and coal, as well as describing the costs of transporting the various fuels. From the assembled data and a consideration of consumer preferences, the book clears you what future price trends are likely to be for both fuel gas manufactured from coal and other fuels.

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6. Pipe-line (High-BTU) Gas
7. Underground Gasification of Coal
8. Production of Oxygen
9. Current Research on Synthetic Fuels
10. Petroleum—Supply, Demand and Prices
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12. Coal Prices—Past, Present and Future
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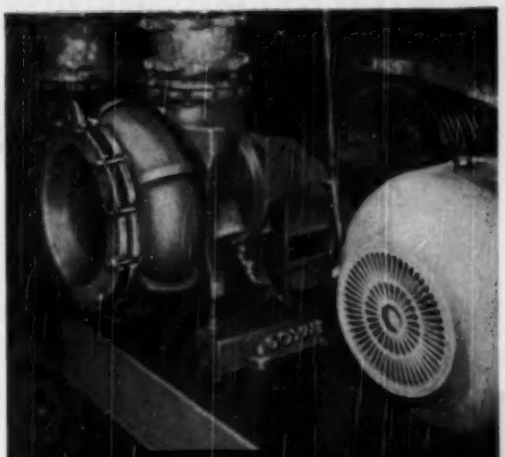

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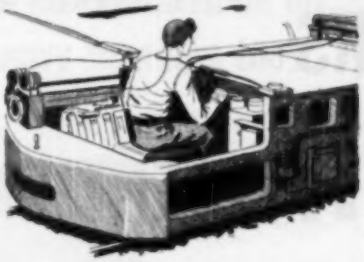

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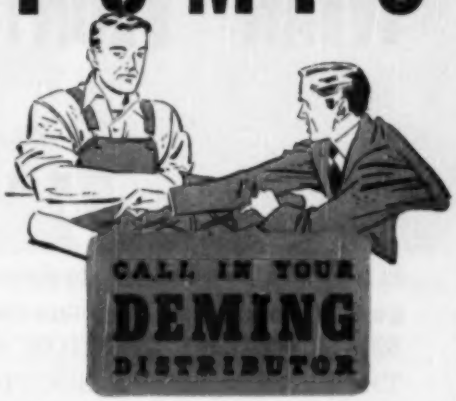

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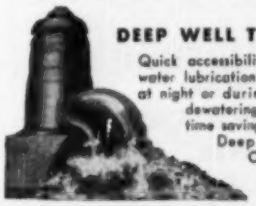

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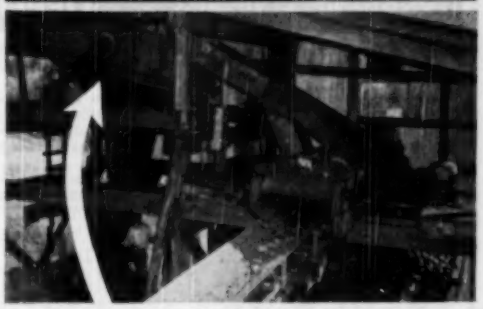

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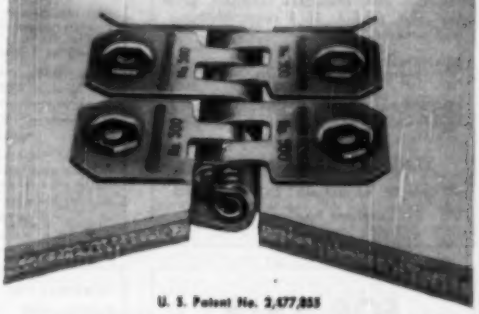

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- Strong, durable . . . pull or tension is distributed uniformly across joint.
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1—600 KW G.E. Syn., 275 V. 900 RPM
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1—500 KW G.E. 275 V. MPC Generator 900 RPM
1—300 KW G.E. 575 V. HCC Converter 1200 RPM

AIR COMPRESSORS

2—4200' Ingersoll-Rand, Type PRE-2, Size 35 x 20½, 24, Direct Connected to 700 HP, G.E. Syn. 15 Motors, 440/600/2300/4000 Volts AC.

LOCOMOTIVES

2—30 T JEFFREY 250 V. MH-77 48-36" Ga.
2—20 T JEFFREY 250 V. MH-77 48-36" Ga.
2—15 T JEFFREY 250 V. MH-77 42-36" Ga.
1—13 T JEFFREY 250 V. MH-2110 42-32" Ga.
1—13 T GOODMAN 250 V. 136-B 48-36" Ga.
1—10 T JEFFREY 250 V. MH-110 44-32" Ga.
1—10 T G.E. 250 V. HM-829-A 48-36" Ga.
2—10 T GOODMAN 250 V. 36-B 48-36" Ga.
1—8 T WEST. 250 V. ML-906-C 44-36" Ga.

LOCOMOTIVE MOTORS

2—Jeffrey 250 MH-77, Ball Bearing
2—WEST. 250 V. ML-908-C, Ball Bearing
2—WEST. 250 V. ML-907-C, B. B. (New)
1—WEST. 250 V. ML-907-C, Ball Bearing
2—WEST. 250 V. ML-906-C, Ball Bearing
2—WEST. 250 V. ML-904-B, B. B. (New)
1—WEST. 250 V. ML-901-C, Ball Bearing
2—G.E. 65/125 V. HM-829-A, Ball Bearing

LOCOMOTIVE ARMATURES

MH-77-250 V. MH-78-500-V. 908-C-500-V.
907-C-250 V. 906-C-250 V. 903-C-250-V.
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W6455, COAL AGE,
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SQUIRREL CAGE MOTORS, 3-Ph., 60-Cy.

Qu.	HP	Make	Type	Volts	RPM
1	400	G.E.	IK	2300	514
1	400	G.E.	KT-412	2200	450
1	400	G.E.	KT-412	550	450
1	300	Al.Ch.	AR	440	1760
1	250	Whse.	CR	2200	1160
1	250	Whse.	CR	440	1160
1	200	Al.Ch.	AR	220/440	580
2	125	Al.Ch.	AR	220	1750
1	125	Whse.	CR-761	440	1750
1	125	Whse.	CR-772	2300	1170
1	125	Whse.	CR-772	440	1170
2	125	C.W.		440	450
2	100	Whse.	CR-663	440	1750
1	100	Al.Ch.	AR-226	2200	1160
1	100	Al.Ch.	AR-226	440	1160
1	100	G.E.	KT-556	2200	865
1	100	F.M.	HS-201C	440	880
1	100	G.E.	KT-556	550	865
1	100	Al.Ch.	AR	550	600
1	100	Al.Ch.	AR	440	575
1	100	F.M.	H-241B	440	450
1	100	Whse.	CR-938	2200	514
1	100	Al.Ch.	AR	444	495
1	78	G.E.	I-15-K	220	570
2	75	Al.Ch.	AR	2200	1765
1	75	Al.Ch.	AR	550	1765
1	75	Whse.	CR	440	1750
1	75	Burke	RM-10	550	720
1	50	Whse.	CR	440	600

1—Unused G.E. Vertical Pump Motor, 300 HP, KP-574, 220-Volt, 3-Phase, 60-Cycle, R.R., 580 R.P.M., drip proof.

SYNCHRONOUS MOTORS, 3-Ph., 60-Cy.

Qu.	HP	Make	P.F.%	Volts	RPM
1	450	G.E.	90	440	300
1	400	Whse.	80	440	600
1	300	Al.Ch.	100	2300	900
2	250	Al.Ch.	90	2200	514
1	250	G.E.	100	2300	514
1	200	Whse.	80	440	360
1	150	G.E.	100	2200	900
1	150	G.E.	80	550	450
1	150	Whse.	100	2200	600
3	125	El.Mch	100	4000	900
1	125	G.E.	80	2200	900
3	100	Whse.	80	440	1800
1	100	Ideal	80	440	900
1	100	Whse.	100	2200	1200
2	100	G.E.	80	440	600
1	60	G.E.	80	440	1200
2	50	G.E.	90	2300	600

SLIP RING MOTORS—CONSTANT DUTY 3-Phase, 60-Cycle

Qu.	HP	Make	Type	Volts	RPM
1	2000	G.E.	MT	2200	300
1**	2000	G.E.	MT-39	2300	240
1**	1500	Al.Ch.	ANY	2300	720
1**	1200	Cr.Wh.		2300	327
2**	1000	Al.Ch.	ANY	2300	225
1	1000	Whse.	CW	2200	444
1**	800	G.E.	MT-12	6600/2300	900
1	700	G.E.	MT-432	2200	400
1**	600	G.E.	MT-412	2200	710
2	500	G.E.	I-16-M	2200	450
1***	400	G.E.	MT-574	550	585
1	400	G.E.	I-217-M	2300	875
1**	400	G.E.	I-M	2300	590
1**	400	Al.Ch.	ANY	2300	585
2	400	G.E.	MT-412	2200	440
1	300	G.E.	I-E15-M	2200	1200
1	300	Al.Ch.	ARY	2300	585
1	250	Al.Ch.	ARY	440	440
1	250	Whse.	CW-1106	2200	1500
1	250	Whse.	C.W.	550	514
1	250	G.E.	MT-414	2200	300
1	150	G.E.	I-E13-M	2200	1750
1***	125	Whse.	C.W.-570	2300	900
1	100	Al.Ch.	AEY	440	1160
1	100	F.M.	429-C	440	900
1	75	G.E.	I-M	440	600
1	50	G.E.	MT-536	2300	1150
1	50	Al.Ch.	ARY	440	850
1	50	Al.Ch.		2200/440	514
1	40	Al.Ch.		2300/440	435

*—Mill type pedestal bearing. **—S-bearing.

TRANSFORMERS—(OIL COOLED)

Qu.	K.V.A.	Make	Type	Ph.	Volt
2	4500	G.E.	HT	3	27000/13500/2300
3	500	G.E.	B	1	13200/11880/220/440
3	200	Pitts.	OISC	1	14400/12000/220/440
3	150	Pitts.	OISC	1	14400/12000/2300/4600
3	130	G.E.	H	1	19000/9500/550/2300
3	100	Whse.	SB	1	12075/10955/230/460
2	100	G.E.	H-KF	1	4160/120/240
3	75	G.E.	H-KF	1	7400/4160Y/120/240
3	50	Al.Ch.	OISC	1	2200/220
2	50	WagnerHE		1	13200/11880/575/287

Available for inspection on its original foundation (1) 1500-KW Westinghouse M-G Set, 250-VDC, 514 R.P.M., comp. Interpole, 2150-HP, syn. motor, 80 P.F., 514 R.P.M., 4600 Volt, 3-ph., 60-cy. (will recommend for 2200-V), with complete DC and AC panels and reduced voltage starting equipment for syn motor.

MOTOR GENERATOR SETS

Qu.	KW	Make	RPM	Volts DC	Volts AC
2	1500	G.E.	600	600	4160/2300
1	1250	Al.Ch.	750	525	4800/2400
1	600	Al.Ch.	900	250	2300
1	600	Al.Ch.	720	525	2300/440
1	500	Al.Ch.	720	525	2300/440
1	400	Whse.	900	250	4600/2300
1	175	G.E.	720	250	2300/440
2	150	C.W.	900	250	2200/440
1	100	Ridgway	1200	275	4000/2200
1	100	Delco	1200	120/240	2300/440
1	75	Whse.	900	75	2300
1	75	Al.Ch.	900	250	2300
1	75	Whse.	1200	125	440/220
1	75	Whse.	1200	250	2300/440
2	75	Whse.	900	250	440/220
1	50	Reliance	1750	250	440/220

(4 Units Variable Voltage Set with 5 K.W. Exciter)

1	35	G.E.	1750	125	440 220
1	30	Reliance	1750	250	440/220
2	25	Whse.	1200	120/240	440/220
1	0	G.E.	1750	250	440/220

DIRECT CURRENT MOTORS

Qu.	HP	Make	Type	RPM
4	1500	Whse.	Rect.	600
2***	1250	Whse.	Mill	300/600
4***	900	Whse.	Mill	600
1	400	Al.Ch.	Mill	400/1200
1***	350	G.E.	MCF-4	300/600
1	250	G.E.	CD-169	1150
1	225	Whse.	QM	450/900
1	200/250	El.Dy.	222	400/1200

T. B. MAC CABE COMPANY

4316 CLARISSA STREET — PHILADELPHIA, PENNA

MINING EQUIPMENT

Joy 14-BU Loaders — Joy Shuttle Cars.
Joy Caterpillar Trucks.
Joy Hydraulic Drill.
Joy 20" Chain Conveyors.
Joy LaDel 30" Belt Conveyor.
Jeffrey 35-BB Mining Machines.
Goodman Type 3304T Locomotive.
Goodman 212G3 Low Vein Mining Machine.

What do you need?

THE INDUSTRIAL EQUIPMENT CORP.

910 First National Bank Bldg.,
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Atlantic 1-2929

FOR SALE

One #6 Northwest 1½ yd. Diesel Crane, 60' boom with shovel front.

Completely overhauled and reconditioned. Excellent Condition.

Available for immediate delivery. Can be inspected in operation.

GLAZER STEEL CORPORATION
Knoxville, Tennessee — Phone 4-8601

NEW MINE CARS

100—Sanford-Day Rotary Dump All Steel Mine Cars, 3-ton capacity; 6' wide; 11'8" overall length; inside length 10'; height 36"; wheel base 38"; 3" axle; 24" wheels; 42" track gauge. New.

40—Drop Bottom Mine Cars, capacity 262.5 cu. ft. level full; length of box 12'6"; length overall 14'4½"; height over rail 48"; wheel base 48"; single link and pin coupling; will negotiate 2½ frog; 16" ball bearing wheel, 3⅞" axle; 3-door drop; 42" track gauge. New.

502—All Steel Rotary Dump Mine Cars, 2-ton capacity; 16" Timken roller bearing wheels; height 36"; track gauge 36". All practically new. A bargain for quick sale.

LOCOMOTIVES, 250 VOLT DC, BALLBEARING MOTORS

2—20-ton Jeffrey, Type MH-77.
5—15-ton Jeffrey, Type MH-110.
2—15-ton Goodman, Type 56-AO4C.
5—15-ton General Electric, Type HM-820.
3—12-ton Westinghouse, Type 906C.
5—10-ton General Electric, Type HM-830.
5—10-ton Goodman, Type 56B.
5—10-ton Westinghouse, Type 907C.
5—8-ton General Electric, Type HM-819.
4—8-ton Westinghouse, Type 906C.
4—6-ton Goodman, Type 82A6F.
4—6-ton General Electric, Type HM-821.

BATTERY LOCOMOTIVES

3—Low, permissible type Goodman 6-ton Combination Battery and Trolley Locomotives, 26" high.
6—Permissible type Westinghouse 6-ton Combination Battery and Trolley Locomotives, 26" high. All equipped with new Edison batteries. This is recent, late type equipment.

LOADING MACHINES, 250 VOLT DC.

11—7-BU Joy, late type, rear conveyors, just taken out of service. Bargain for quick sale.
5—14-BU Joy.
4—360 Goodman.
5—L-400 Jeffrey.
2—L-600 Jeffrey.
5—No. 3 Myers-Whaley Automat.

Frank J. Wolfe Sheldon J. Wolfe

CUTTING MACHINES, 250 VOLT DC.

15—35-BB Jeffrey permissible type, 22,000 and 23,000 series.
2—7-AU Sullivan.
2—324-EJ Goodman bottom cutters with bug-dusters.
5—112-EJ Goodman.

SUBSTATION EQUIPMENT

1—300 KW: (General Electric Rotary Converters, Type HCC-6, Form F, 1200 RPM, 2—200 KW: (complete with switchboards and all necessary voltmeter, 1—100 KW: (2300/4000 volt, transformers

MISCELLANEOUS

1—New 42" Belt Conveyor complete with drives, head and tail sections, 1000' centers, Timken bearing 3-roll troughing carriers, return rollers, channel frame sections, and all necessary appurtenances.
1—No. 7 S33 McNally-Norton Coal Washer.
7 Track, 5-Track, and 2-Track Steel Tipples.

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WE SPECIALIZE IN BUYING OUTRIGHT COMPLETE MINES THAT ARE GOING OUT OF BUSINESS OR FROM RECEIVERS IN BANKRUPTCY, ADMINISTRATORS OF ESTATES, ETC.

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MOTORS
GENERATORS
TRANSFORMERS
1 to 1500 H. P.
ELECTRIC EQUIPMENT CO.
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NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton 12" to 56" Track Gauge.
GREENSBURG MACHINE CO.
Greensburg, Pa.

CARLYLE
INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

IMMEDIATE DELIVERY OF CONVEYOR, ELEVATOR AND HOSE BELTING — FIRE, WATER, SUCTION, AIR, STEAM AND WELD END HOSE

SUCTION HOSE
Stock No. CO-443-C

Heavy-duty, smooth bore, wire inserted Suction Hose. Flexible and strong. For use in mines, sewers, trenches, etc., with diaphragm pumps, pressure pumps and other contractors equipment. Prices shown include I.P.T. Couplings attached to each length.

I. D. Hose and Length	Price Per Length	I. D. Hose and Length	Price Per Length
1¼"x10 ft.	$ 5.50/	3"x15 ft.	$36.50
1½"x15 ft.	7.50/	3"x20 ft.	47.50
1½"x20 ft.	10.00/	4"x10 ft.	25.00/
1½"x10 ft.	6.50/	4"x20 ft.	46.00
1½"x15 ft.	9.00/	4"x15 ft.	33.00/
1½"x20 ft.	14.00/	5"x20 ft.	90.00/
2"x10 ft.	12.00/	6"x10 ft.	90.00
2"x15 ft.	22.75	6"x15 ft.	126.00
2"x20 ft.	30.25	6"x20 ft.	161.00
2½"x10 ft.	15.00/	*I. P. T. Nipples or Couplings attached to Hose.	

DISCHARGE HOSE
Stock No. CO-447

Cotton jacket, rubber lined hose suitable for water supply and discharge service. Constructed exactly like Fire Department hose. Light in weight. For pressures to 200 lbs. Attached to each length are Iron Pipe Thread Couplings.

Inside Diameter	Price Per 25 Ft. Length	Price per 35 Ft. Length	Price per 50 Ft. Length
1¼"	$8.75/	$15.75	$21.75
1"	15.00	20.50	28.25
2½"	17.50/	23.00/	31.50
3"	25.75	34.75	47.50
4"	30.00/	40.00/	50.00/

HIGH PRESSURE HOSE
Stock No. CO-448

2½" x 8 PLY DUCK AND CORD CONSTRUCTION SUITABLE FOR 400 LBS. WORKING PRESSURE

For that difficult job where high pressures are encountered Carlyle offers this rugged flexible hose saving you over 50% in cost and giving dependable service for the following jobs—

* Jetting—Water, Air, Cement
* Hydraulic Grout
* Steam to 100 lbs. Pressure
* Oil Discharge

Low Priced at ..... $1.00 ft. */

Available in 10-15-25-30-50 ft. Lengths. High Pressure Couplings attached as follows:

		Per Set
Male and Male	2½"I.P.T.	$10.00
Female & Male	2½"I.P.T.	12.00
Female & Female	2½"I.P.T.	16.00

COMPRESSOR AIR HOSE
Stock No. CO-441

250 Lbs. Working Pressure. Heavy-duty extremely flexible. Pneumatic Air Hose. For all Air Tools, Compressors, Chippers, Riveters, Drills and Breakers. Each length complete with Universal Air Hose Couplings attached. These Couplings are quick acting and interchangeable with Air King, Chicago, Cleveland and others.

I.D. Size and Length	Price Per Length
¾"x25 ft.	$ 7.75
¾"x50 ft.	14.00
¾"x25 ft.	9.25
¾"x50 ft.	17.00
1"x25 ft.	11.00
1"x50 ft.	20.50

*—many stocked. Drastically reduced prices to move.
Terms:—f.o.b.—N. Y. City—2%—10 days.

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1—D-4400 Caterpillar Diesel Power Unit (less than 3,000 hrs.). V-belted to a 30 KVA Fairbanks Morse 220 volt, 3 phase Generator, complete with Exciter and switchboard.

BELT CONVEYORS

1—30", 70' long, new belt, complete with motor.
1—42", 20' long, complete with motor.

PIT CARS

150 Card Iron Works R.B. Pit Cars, 36" Gauge, 1.7 Ton Cap.
35 Card Iron Works R.B. Pit Cars, 36" Gauge, 1 Ton Cap.

PUMPS

1 HP. to 25 HP. I. R. Motor Mtd. Cent. Pumps.
4" & 8" Peerless Deep Well Pumps.
6" & 8" Hydroseal Slurry Pumps.
2" Wilfley Sand Pumps.

MOTORS — 440 Volts AC

1—50 HP. G. E. 900 RPM.
1—35 HP. G. E. 1200 RPM.
1—35 HP. G. E. 1800 RPM.
1—30 HP. G. E. 3550 RPM.
1—25 HP. G. E. 600 RPM.
1—25 HP. G. E. 1200 RPM.
1—20 HP. West. 860 RPM.
1—15 HP. U. S. BB 1200 RPM.
1—10 HP. West. 870 RPM.
1—10 HP. G. E. BB 1160 RPM.
1—10 HP. West. 1740 RPM.
2—10 HP. G. E. Vert. or Horiz., 1160 RPM.
1—50 HP. G. E. Slip-ring 1720 RPM., 2200 volts.
1—35 HP. Allis-Chalmers Slip-ring, 850 RPM.
1—60 HP. G. S. Slip-ring, 900 RPM, 2200 volts.
1—15 HP. Allis-Chalmers Slip-ring, 1150 RPM.
New and used fractional HP. Motors.

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REBUILT MINING MACHINES
READY TO GO INTO SERVICE

3—112 A.A. Goodman Universal D.C.
4—112 G.SA. Goodman Universal 220 Volts A.C.
3—112 G.3 Goodman Universal 220 Volts A.C.
4—60 H.P. Goodman Stanadards 220 V. A.C.
2—Goodman Track Cutting Machines 42 inch Gauge A.C. 220 Volts.
2—Goodman Loading Machines 42 in. Gauge type 1SSD A.C. 220 Volts.
4—35B Jeffries Machines 230 Volts D.C.
1—35BB Jeffries Machines 220 Volts A.C.
6—CE Sullivan Machines A.C. and D.C.
3—7B Sullivan Machines 250 Volts D.C.
1—300 K.W. G.E. M.G. Set 1200 r.p.m. complete with Switch Board & Controls.
1—100 K.W. G.E. M.G. Set 1200 r.p.m. can be seen in operation.
1—Electric Hoist complete with 150 H.P. G.E. Motor.

LOCOMOTIVES

6—6 Ton G.E. Ball Bearing 42 inch Gauge.
3—Goodman Caterpillar Trucks 220 Volts A.C.
4—6 BU Joy 36 and 42 inch Gauge on Cats. A.C. and D.C.
4—5 BU Joys 42 inch Gauge on Cats. A.C. and D.C.
2—2 Lee Norse Six Ton Knal-Mobiles Model K.M.C. 482.

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BELT CONVEYORS FOR SALE

1—42" x 450' Robins Belt Conveyor with Robins anti-friction troughing and return idlers with dual drive gear reducer and 75 H.P. A.C. motor.

1—42" x 125' Robins Conveyor, same specifications.

Please send for details and low price.

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COAL MINE EQUIPMENT
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Shovels, Cranes, Draglines, ¾ to 10-yd.
Bucyrus 650 V Diesel 1940 Dept., 12 yards.
Sterling 12-yd. diesel rock trucks (5).
Athey 12-yd bottom dumps, unused (2).
1,000 HP diesel engs. Gen. sets 100-300 KW.
Locomotives: 7 to 50 tons, diesel, gas, stm.
C.P.T. diesel compressor, 1,574 ft., 300 HP.
Rotary dryers, 6'x40', 6'x32'; kilns, coolers.
B Erie shovel front, 2¼ yd., 52B-55B.
H. Y. SMITH CO., 628 N. B'way, Milw. 2, Wis.

FOR SALE
Two-roll Link-Belt Crusher

Capable of reducing run-of-mine coal to 2"x0 at the rate of 250 tons per hour, complete with 250-volt motor and starter. The crusher can be adjusted to produce 2", 3" or 4"x0 coal. This equipment is as good as new.

INLAND STEEL COMPANY
Wheelwright, Kentucky

GUARANTEED EQUIPMENT
SUBSTATIONS

300 KW, 175 KW, 75 KW complete with manual or automatic control. Advise primary AC voltage.

MOTORS

150 HP, 900 RPM 220/3/60 Syn.
125 HP, 1800 RPM, 230 volt DC
80 HP, 1200 RPM, 220/440/3/60 Ind.
75 HP, 1800 RPM, 220 or 440/3/60 Ind.
75 HP, 900 RPM, 220/3/60 Syn.
5-7½-10-15 HP. AC & DC in Stock.

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NEW — MOTORS — USED

7½ h.p. G.E. 300 v. 450/1200 r.p.m.
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7½ h.p. G.E. 230 v.—1150 r.p.m.
5 h.p. C-W Vertical, 230 v.—900 r.p.m.
5 h.p. G.E. v.—550/1000 r.p.m.
5 h.p. West. 220 v.—835 r.p.m.
1 h.p. G.E. 230 v.—535/2100 r.p.m.
1 h.p. G.E. 230 v.—1150 r.p.m.

PARTIAL LISTING—INQUIRIES SOLICITED
NEW—USED A. C MOTORS—ALL SIZES.

FALK MACHINERY COMPANY
15 Ward St., Rochester, N. Y.
Baker 5887

2—Goodman Style G20B77 permissible Shaker Conveyors, latest type, with manual type HAD duckbill and 20 HP Westinghouse AC motor, 3 phase, 60 cycle, 220 volt, 1160 RPM.

without line troughs ..... $2,000.00 each
with 360° new line troughs ..... 4,350.00 each

The above equipment is to include all usual accessories and is guaranteed to be in A-1 condition. New in 1943. It is offered subject to prior sale, f.o.b. Sunnyside, Utah.

KAISER STEEL CORPORATION
Sunnyside Mine
Sunnyside, Utah

FOR SALE

CRUSHERS

1—24x24 McNally Pittsburgh single roll crusher.
1—24x36 McNally Pittsburgh single roll crusher.
1—24x48 McNally Pittsburgh double roll crusher.
1—36x48 Link Belt double roller crusher.
1—18x18 Jeffrey single roll crusher.
1—30x36 United Iron Works single roll crusher.
1—24x24 Jeffrey single roll crusher.
1—24x24 Hercules single roll crusher.

HOISTS

1—Ottumwa Iron Works conical drum hoist, serial #3162, weight 25,000#, 1¼" rope, complete with remote control and hydraulic brake. Direct connected to GE 300 HP motor, model #C9647, type 1TC-5017, form M 2/60/2200 V, 570 RPM, 75½ amps, 372 secondary amps, complete with automatic switchboard.

1—Ottumwa Iron Works, single rigid cylindro-conical drum hoist, serial #4030, weight 42,000 lbs. 1¼" rope, complete with remote control and hydraulic brakes direct connected to Western Electric 150 HP. motor, model 12815, type MT-364-10-150-790, form B, 3 phase, 60 cycle, 440 volts, slip ring, secondary volts 385, amps. 187, secondary amps. 182, speed full load 700, serial #4543312, continuous 40° C. Complete with controller and resistance.

1—Ottumwa Hoist #2361, drum diameter 49", face 96", face grooved for 1" rope, equipped with post brake 54" diameter, hand operated, single reduction cut spur gears, 10 tooth and 190 teeth, 1¼" pitch, 10" face, drum shaft 7" diameter, drum shaft bearing 7"x14", pinion shaft bearing 4½"x15" of the ring oiling type.

LOCOMOTIVES

1—15 ton Goodman ball bearing locomotive, 42" gage, type 30-A-O-4-C.
3—8 ton Goodman ball-bearing locomotives, 20" gauge, type 32847.
1—8 ton Goodman ball bearing locomotive, 42" gauge, type 32-AO-42.
1—8 ton Westinghouse locomotive, 20" gauge. Class 4-2-36-C-437.
1—6 ton Jeffrey locomotive, 42" gauge.
6—6 ton GE ball bearing locomotives, 42" gauge, class 3MT7MMH1 with 7EM81-A motors.
1—6 ton Whitcomb Battery locomotive, 20" gauge.
2—4 ton Goodman ball bearing locomotives, 20" gauge, type 42-I-4-T, (with or without gathering reels).
1—20 ton Goodman ball bearing locomotive, 42" gauge, type 20AO42.

MINING MACHINES

1—112AA Goodman DC Universal mining machine, 20" gauge, 6½ ft. cutter bar.
2—CLE2, AC, 3 phase, 60 cycle, 220 volt, Sullivan longwall mining machines.
1—Jeffrey Shortwall Mining Machine, 35 BB, AC, 6' cutter bar complete with tip turn trunk, cable reel reel.
1—Sullivan Shearing Machine, Class CH11, DC, 9' cutter bar.
2—Sullivan Longwall Mining Machines, type CH8, 3/60/220 volts, 20" cutter bars.
1—12AA Goodman mining machine, 50 HP, 42" gauge.
2—Goodman Standard mining machines, 50 HP, 3/60/220 volts, 42" gauge.

MOTOR GENERATOR SETS

1—200 KW GE motor generator set #675642, type MPC-6-200-1200, form L, amps 726, speed 1200, volts no load 250, volts full load 275, 200 KW nominal—300 KW 1 hrs., 55° C rise direct connected to 300 HP GE 470, motor #1352909, type ATI-6-300-1200, form C, 60 cycles, 75 amps, speed 1200 RPM, volts 3300, PF 8, HP output 300. Complete with switchboard.

1—60 KW GE motor generator set type CD 123, form A, comp. wound, 227 amps, 230 volts no load, 275 volts full load, 1200 RPM, cont. 50 deg. cont., #1539004 direct connected to 125 HP GE syn. motor type TS, form PK, frame 7359, 3/60/2300 volts, 1200 RPM, 37.6 amps, cont. 40 deg. cont. Excitation 250 volts, 6.8 amps. .74 PF, #4314071, complete with switchboard.

1—300 KW Synchronous Ridgway Motor Generator Set, 1200 rpm, 250 volts, DC, 2300 volts, AC, complete with switchboard.

VIBRATORS

1—Allis Chalmers Aero-Bite single deck vibrator, size 1½' x 4'.
1—Stephens Adamson two deck vibrator size 6' x 10'.
1—Doubledeck vibrator size 3' x 6½'.
1—Selectro double deck vibrating screen size 6' x 10'.

RAILS

Truckload and car lots of good second hand 16 and 25 lb. rails.

ELECTRIC DRILLS

2—Desley AC Electric coal drills, size 4T2 phase, 60 cycle, 220 volts.
1—Desley Electric coal drill DC.

TIPPLE

1—Steel tipple complete with shaker and concrete silos. Capacity 1,000 tons per day.

DUCKBILLS

2—G20 Goodman Duckbills, DC.

LOADERS

1—6 BU AC Jay Loader, 3/60/220 Volts.

PIT CAR TRUCKS

200—Sets Sanford Day Timken roller bearing trucks, 42" gauge, with 14" diameter wheels.

We are distributors for John A. Roebling's Sons Company wire rope and fittings.

GAVENDA BROTHERS, Inc.

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DUE TO CONVERSION TO CONTINUOUS MINING METHODS, WE OFFER THE FOLLOWING NEW, USED AND RECONDITIONED MECHANICAL MINING MACHINERY FOR SALE:

14-BU Loaders, Model 7RAE.
Jeffrey 35-BB Shortwall Cutters, 7½' long.
Joy 32" Battery Shuttle Cars.
Joy CD-22 Tram Drills.
Joy 30" Belt Conveyors, 2000' sections.
Joy 20" Chain Conveyors.
Joy Cat Trucks.
Jeffrey 6' Aerodyne Fan.
Jeffrey A-6 Post Drills.
Joy PL12-1PE Belt Feeders.
Goodman 6-Ton Locomotive.
Hazleton 4" and 5" Pumps.
Other small incidental equipment available.

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REBUILT—IN STOCK

★ 14BU Loaders
★ 35BB Shortwalls
★ Belt Conveyor
★ Locomotives
★ Motors and Generators
★ 100KW Diesel Unit

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Pittsburgh 6, Pennsylvania
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MINE AND SLOPE HOISTS

1—20,000 # Allis-Chalmers, Dbl Drum
1—24,000 # Nordberg Sgl Drum
1—10,000 # Nordberg Sgl Drum AC
1—15,000 # Vulcan Sgl Drum AC
1—11,000 # Wellman, Sgl Drum AC
1—16,000 # Allis-Chalmers Sgl Drum
1—30,000 # Allis-Chalmers Dbl Drum AC
1—7,000 # Flory Sgl Drum AC

CARPULLERS AND LOADERS

1—6000 # Jeffrey Carspotter AC
1—4000 # Brownie Carspotter AC
1—5000 # Link-Belt Carspotter AC
1—20,000 # Amer. Hoist Carspotter AC

CRUSHERS & MISC.

1—30x30 Link-Belt Dbl Roll
1—36x36 Jeffrey Sgl Roll
1—12x16 Eagle Dbl Roll
1—18x20 Eagle Dbl Roll
1—3 yd. Sauerman Scraper Bucket System

HAWKINS & CO.

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TELEPHONE HARRISON 7-0725

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COMPLETE ELEVATORS • DRAG CONVEYORS • PAN & RECIPROCATING FEEDERS

ELEVATOR BUCKETS — WRITE FOR LITERATURE — CONVEYOR PULLEYS

IMMEDIATE DELIVERY — REDUCED PRICES

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PHILADELPHIA 40, PENNA.

REBUILT ELECTRICAL MACHINERY

M-G SETS & ROTARIES

1000 KW G.E. 600 v.—2300/4000 v.
500 KW West. 250 v.—2300 v.
300 KW G.E. Rotary 275 v.—2300/4000 v.
2—200 KW G.E. 275 v. MPC—2300 v. ATI.
150 KW G.E. 500 v.—2300 v.
150 KW Ridg. 275 v.—2300 v.
100 KW G.E. 275 v.—2300/4000 v.

AC MOTORS

HP	MAKE	SPEED	TYPE	WDG.
1000	West.	450	CW	S.R.
600	G.E.	450	MT	S.R.
350	West.	600	CW	S.R.
300	G.E.	450	IM	S.R.
140	G.E.	600	IK	S.C.
150	West.	514	CS	S.C.
150	G.E.	600	ATI	Sys.
100	G.E.	450	IM	S.R.
100	West.	1200	CS	S.C.
75	G.E.	600	ITC	S.R.

Also smaller units to specifications.

DC GENERATORS

275 KW West. 250 v. 500 RPM
200 KW West. SK 250 v. 600 RPM
150 KW West. SK 250 v. 600 RPM
150 KW G.E. RC 550 v. 1200 RPM
150 KW Triumph 280 v. 600 RPM
100 KW West. 250 v. 600 RPM
Also smaller sizes in stock.

LOCOMOTIVES AND CUTTING MACHINES

25 Ton G.E. 500 v. 42/44" Ga. HM 824
8 Ton Goodman 250 v. 44/42" Ga. 9104C2
8 Ton Goodman 500 v. 44/42" Ga. 9104C2
4 Ton Westgh. 250 v. 36" Ga. 904
4 Ton G.E. Battery 42/44" Ga.
5½ Ton Ironton Battery 42/44" Ga.
12 CA Goodman 4' cutter 250 v. DC
12 G3 Goodman 6' cutter 220 v. AC
35 B Jeffrey 6' cutter 250 v.

Transformers, hoists, pumps, compressors.

MOORHEAD ELECTRICAL MACHINERY CO.

363 Noblestown Road, Oakdale, Pa. **WAlnut 1-4300**

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McCAFFREY Model 648 *Rud-O-Matic* Tagline.

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HP		MAKE	TYPE	SPEED
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175		G. E.	MD	450
150		Westg.	SK	800
125		G. E.	CD	600
125		Century	drip proof	1200
100		Westg.	SK-190	1200
100		Westg.	S	675
75		G. E.	CDM	1200
60	NEW	G. E.	DC—splash proof	850
60	NEW	Westg.	SK-183	850

D.C. Generators—250-275 V.

KW		MAKE	TYPE	SPEED
250		Westg.		1200
200		Westg.	SK-210	900
150		Westg.	SK	900
150		Westg.	SK-190	700
100		Westg.	SK	720
100		Westg.	S	850
100		G. E.		900
75		Allis Chalmers		720
75		Westg.	S	850
75		Allis Chalmers		850
60	NEW	G. E.	CD	1150
60	NEW	Westg.	SK-183	1150

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No.	KVA	Make	PRIMARY	Sec.
2	500	G.E.	2300	230/460
6	333	Maloney	2300	230/460
3	200	G.E.	2400/4160Y	240/480
3	150	West.	2400/4160Y	240/480
3	150	Pgh.	2300	230/460
1	100	Peerless	2300	230/460
3	75	West.	2300	230/460
1	75	West.	13200/8000	2300
3	37½	Packard	2300	115/230
2	25	Maloney	2300	115/230

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200 KW Reliance DC 275 v., syn. motor, 440 v.
200 KW Ridgeway DC 550 v., synch. 2300/4000 v.
200 KW G.E. DC 125 v., cynch. motor, 440 v.
150 KW Burke DC 260 v., synch. motor, 440 v.
150 KW Whse. rotary, 250 v., AC 2300 v.
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75 KW Star b.b. DC, 260 v., synch. motor, 440 v.

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CONVEYORS — IDLERS

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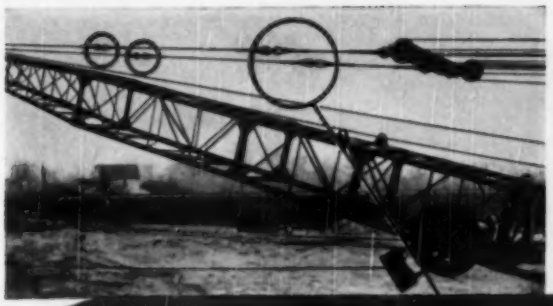

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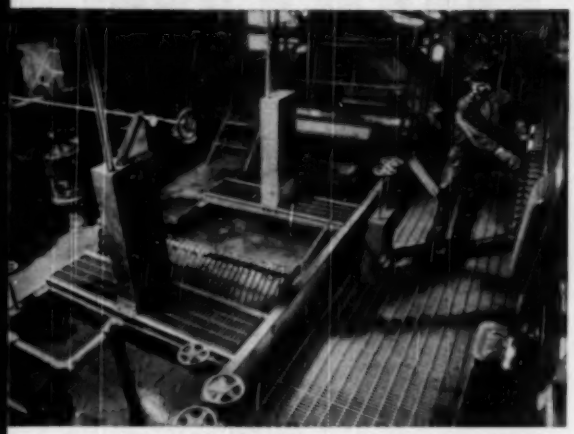
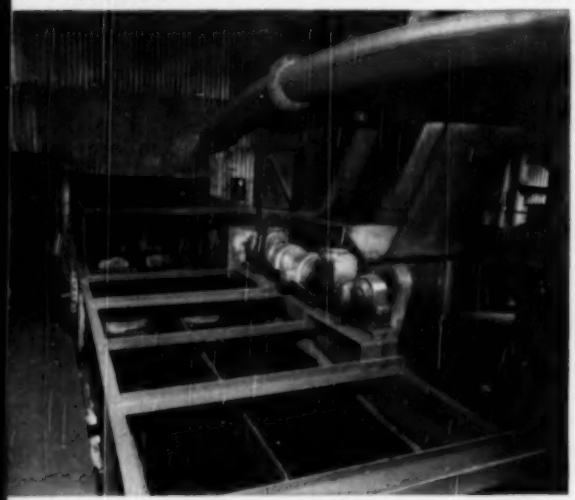
LINK-BELT

Coal Washers



The Link-Belt Air-Pulsated Washer is an all-purpose coal cleaning machine with a wide range of applications as to size and characteristics of the coal. It handles large volumes of either sized or unsized coal.



The Link-Belt Combination Trough Separator and Air-Pulsated Washer removes a large part of the coal and delivers it in a clean state, requiring no further treatment. The remaining coal and refuse are treated in the air-pulsated washer where complete and final separation is obtained. This method handles larger volume with little added investment or operating expense.

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LINK-BELT COMPANY

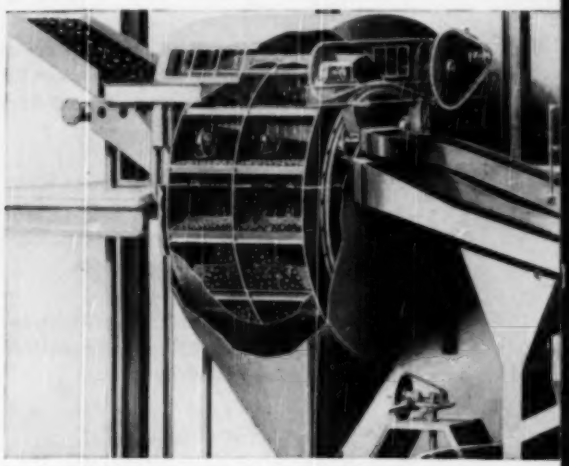
Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8, Johannesburg.

LINK-BELT

COAL PREPARATION and HANDLING EQUIPMENT

Wherever you see any of these coal washers, you see Link-Belt coal-cleaning experience at work—helping mines everywhere meet the more and more exacting requirements of their markets. They do a splendid job in the maximum recovery of coal with minimum operating attention at low maintenance cost.

Thinking about coal-cleaning improvements? Is the problem better grades of coal, meeting varying washability characteristics, more plant capacity, or lower costs? Whatever your requirements—from the smallest to the largest plant operation—it will pay you to consult Link-Belt.



The Link-Belt Float-Sink Concentrator for heavy media* is particularly useful when a separation must be made at an extremely high or low specific gravity; when a large percentage of the raw coal is near the separation gravity; when the amount of impurities fluctuates widely; or when quick adjustment of the separating gravity is desired to meet changing characteristics of the coal or changing market requirements.

*The Heavy-Media Separation Processes are licensed by the American Zinc, Lead and Smelting Company. American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y. are their sole Technical and Sales Representatives for these processes.